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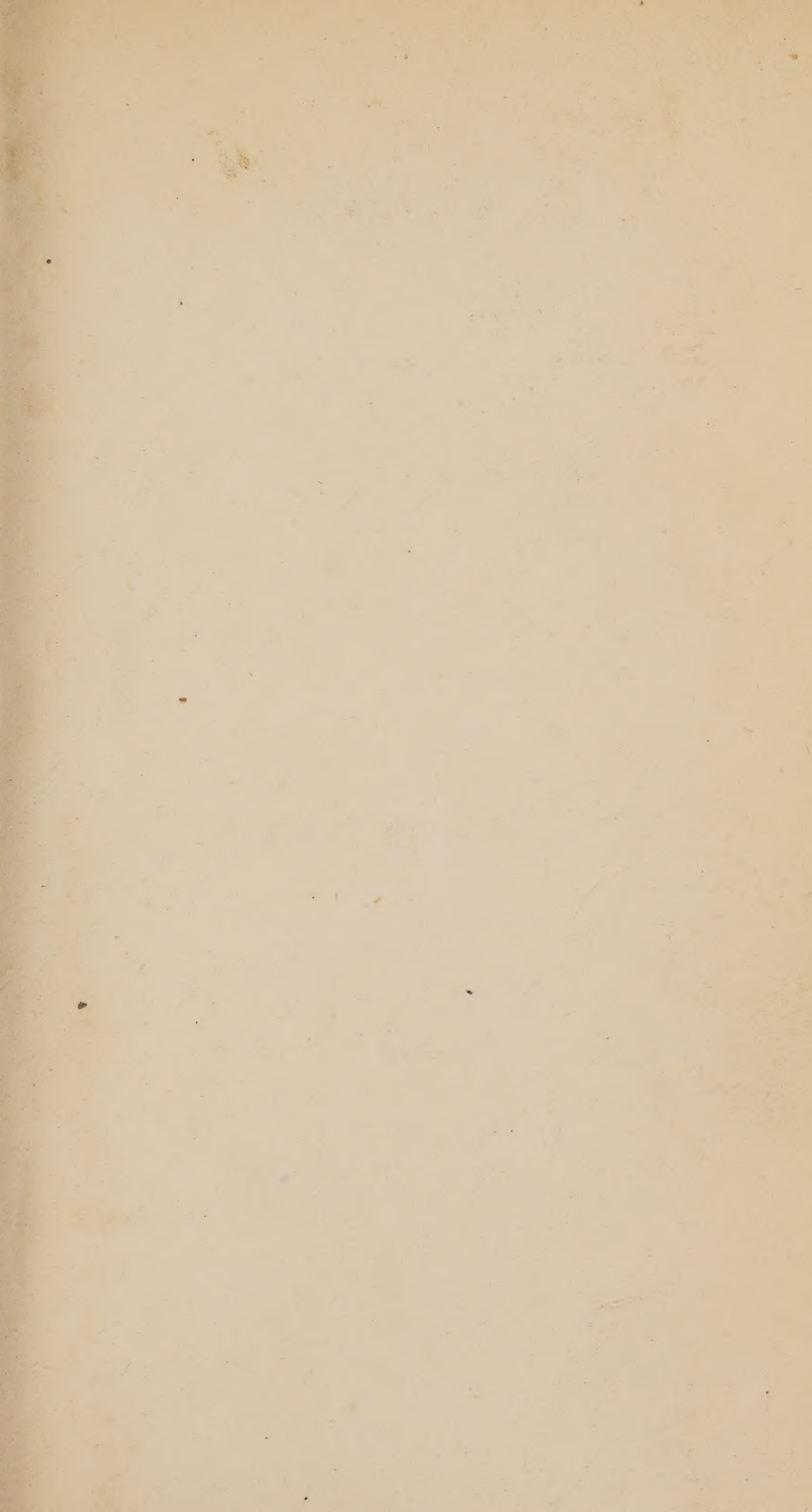




Fig. 1.

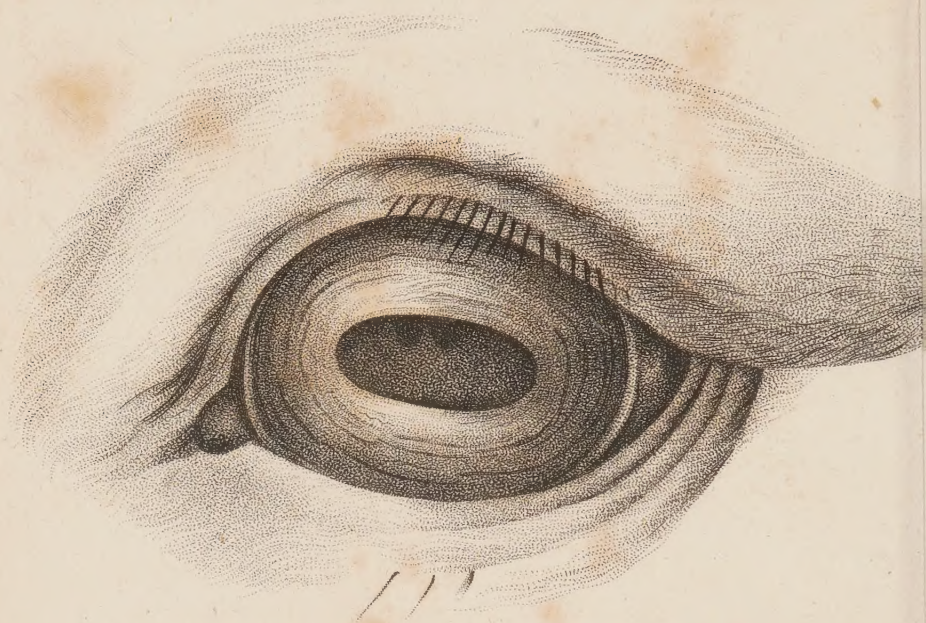
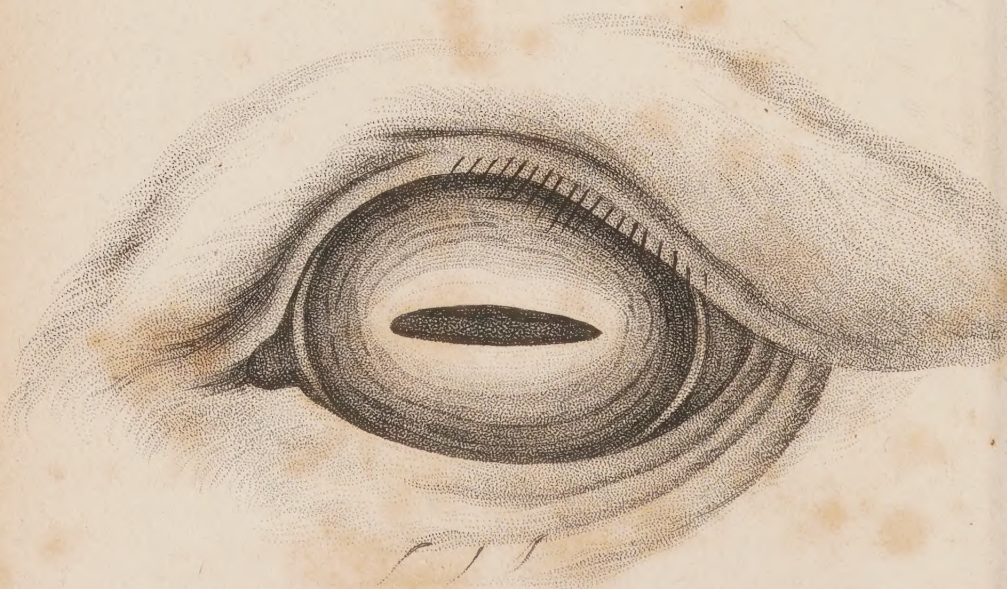


Fig. 2.



J. Shary sculp.

A TREATISE
ON
VETERINARY MEDICINE,
VOL. III.
CONTAINING
OBSERVATIONS ON THE DISEASES
OF THE
DIGESTIVE ORGANS
OF
THE HORSE,
AND
OTHER IMPORTANT DISEASES,
ESPECIALLY THOSE NAMED SPECIFIC, AND PECULIAR
TO THIS ANIMAL.
WITH
PRACTICAL OBSERVATIONS
ON THE
TREATMENT AND PREVENTION OF LAMENESS;
AND
ADDITIONAL REMARKS
ON
THE NERVE OPERATION.

ILLUSTRATED BY PLATES.

BY JAMES WHITE,
Veterinary Surgeon, late of the First or Royal Dragoons.

VENIENTI OCCURRITE MORBO.

LONDON:

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DEDICATION.

TO

JOHN ABERNETHY, ESQ. F.R.S.

&c. &c. &c.

SIR,

IN dedicating the following pages to you, I feel considerable gratification, especially as I have received your permission to do so. As the book is but small, I flatter myself you will honour it with a perusal, and then I trust you will find that the valuable instructions I have derived from your Works, as well as from your Lectures, in addition to those for which I am

so much indebted to Mr. Coleman, have enabled me to contribute something to the improvement of Veterinary Science.

I am,

SIR,

Your obliged

And most obedient Servant,

JAMES WHITE.

PREFACE.

THE more I reflect on the various subjects connected with veterinary medicine, the more am I convinced that almost all the Diseases of the Horse, are the effects of immoderate and too early work, and of injudicious management with respect to feeding. This opinion I have many times given, because it appears to be important, and might, if duly impressed on the minds of horse proprietors, lead to a prevention of the numerous and often incurable disorders, by which this valuable animal is now so frequently rendered unserviceable.

The present Edition is considerably altered, and I trust it will be found improved. The favourable reception it has met with has not

failed, I hope, to make a suitable impression on my mind, and will encourage me to continue my attention to Veterinary Science as long as I am able to contribute to its improvement.

* * * *Mr. White may be consulted on the Diseases of Horses and Cattle, either personally or by letter, at Oakhill during the Summer, and at Bath during the Winter.*

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A
T R E A T I S E
ON
VETERINARY MEDICINE.

CHAPTER I.

ON THE DIGESTIVE ORGANS.

IN describing the diseases of the digestive organs, it is necessary to begin with those parts by which food is prepared for the stomach, and to point out the state in which that food should be previous to its being taken into the mouth. In doing this, let us consider the animal in a state of nature, and we shall find that the food which the Almighty has prepared for him is full of juices, and such as is most fit for digestion, nutrition, and the various purposes of the animal economy. The horse is a graminivorous animal, therefore, when brought into the stable, kept on dry grain, hay, straw, or other dry provender, numerous diseases may be expected, unless guarded against by prudent management. The consequences of neglecting this precaution

are diseases of the *digestive organs*, as they are named, that is, the stomach and other parts subservient to digestion. The precautions to be taken are not many, nor are they difficult to be understood or practised; yet are they so generally neglected, that such diseases are more frequent than any, and lead to others which at present are suspected but by few to be connected with them. The reader will perhaps think it strange when I assert that the glanders, the staggers, and almost every other disease may be traced to this source. These diseases have formed the principal subject of the third volume of my Treatise on Veterinary Medicine, a fifth edition of which is now called for. Within a short period I have been led to reflect on these diseases in particular, and these reflections have led me to take such views of the subject as will, I hope, enable me to convey to the public more useful information than any I have yet given. To do this in a manner sufficiently clear to be generally understood, it is necessary to begin with mastication and the state of the food.

State of the Food.

Hay, as it is commonly given, even in the best state, is dry, too dry for mastication, and

often for digestion. For hay that has been suffered to stand until the seed becomes ripe, is nearly, if not quite, void of nutriment; and however perfectly it may be masticated, will only serve to oppress the stomach without affording any thing that is capable of being formed into chyle. Hay that has been kept more than one year becomes dry and void of nutriment, especially when in small mows and exposed to the wind. When hay therefore is given to horses, however good and succulent it may be, it requires to be moistened with water, and given in smaller quantity than I have directed in my first volume. Twelve pounds of hay and one peck of oats is a sufficient allowance both as to proportion and quantity for any horse of whatever size he may be, provided he has only moderate work; but when his exertions exceed that degree which may be termed moderate, then an additional allowance is necessary, and that addition should be in grain.

To return to mastication. The teeth may be imperfect, and often are so; the grinders wear in a different manner from that in which they would were they in a state of nature; consequently sharp edges sometimes are formed on the outside of the higher grinders, and on the inside of the lower grinders, and the inside of the cheeks and the tongue, with the skin or

membrane connected with it, are thereby wounded, which prevents the horse from masticating without considerable pain, and induces him to swallow his food imperfectly chewed: this is more especially the case with hay. When hay is swallowed in this state it does harm, being difficult of digestion, for in that state its juices are not capable of being extracted by the gastric power: hence arises indigestion, flatulency, and numerous disorders. Mastication may be impeded or prevented by that state of the mouth which generally attends teething: it may also be impeded by an injudicious use of the bit, as is well known in regiments of cavalry where it is too common, and has been attributed to the spiculæ of the squirrel-tail grass. The consequence of this is botts, in addition to indigestion and all its consequences, for colts are kept at grass, and it is in this situation only botts are generated.*

* I have lately seen at the kennel, the jaws of two horses, one of which died literally from starvation, in consequence of a disease of the grinding teeth, which appeared to have been brought on by feeding on coarse woody hay, containing the stalks of thistles, docks, &c. This animal was what dealers term a *quidder*: for the muscles of deglutition were at last so affected, that he was incapable of swallowing; and after fruitless attempts to chew his food, it was thrown out in the manger in a ball or quid, and a great deal of imperfectly chewed hay had been forced into the cavities, formed at the roots of some of the grind-

Deglutition.

Swallowing may be prevented by an inflammation of the glands, named tonsils: this prevents the food from being conveyed into the stomach either partially or wholly, unless a suitable diet is prepared for the animal.

Swallowing may be prevented by a palsy of those muscles by which it is effected. This palsy may be total or partial; in the first case the animal is starved, in the latter he lingers longer but is ultimately destroyed by it; for the remedies usually employed are those which produced the disorder, that is, by drawing out the tongue

ing teeth. The other horse had sharp or rather keen edges on the outside of the upper grinders, and the inside of the lower grinders, by which the inside of the cheeks and the tongue had been much injured. In this horse there did not appear to have been any impediment to swallowing, for both the stomach and bowels were full of imperfectly masticated hay and unbroken oats. The stomach had burst and discharged some of its contents into the abdomen; the large bowels contained an enormous quantity of undigested and imperfectly masticated hay and corn, the liver was enlarged, and of a colour approaching to that of lead. The horse had died of the fret or flatulent colic, and had worked only the day before his death in a coal waggon. There was a great number of botts in the stomach of both horses, and a considerable number in the duodenum, or first intestine of the former horse.

by giving balls, and pulling it with such force as frequently to lacerate the under part of the tongue and otherwise injure the muscles of deglutition. Swallowing may be thus prevented, and often is. The practice of tying a horse's tongue to prevent him from running away may not be frequent, but I have known it practised, and the loss of the tongue was the consequence. Three cases of this kind I have met with ; one I was told of by the person who did it, and who cut off the tongue to relieve the animal from his intolerable sufferings, the ligature being buried in the enormous swelling that had taken place. One case I have heard of in which the tongue was literally drawn out by the roots. Swallowing may be prevented by the practice of giving balls, especially when they are large or hard. A morbid state of the pharynx is thereby induced, which renders deglutition difficult and sometimes impossible, the lower part of the pharynx acquiring a morbid irritability, which causes it to contract upon the morsel of food and return it into the mouth where it is often re-masticated, and at length thrown out into the manger like a quid of tobacco. Such horses have been named by dealers *quidders*, and are considered of little or no value : such cases I have seen ; they are incurable because not understood. Were the horse however kept a few weeks on gruel and bran-

mashes, and then turned to grass, the muscles of deglutition would gradually recover their lost power.

Obstructions in the Œsophagus.

Food is sometimes prevented from passing into the stomach by balls sticking in the œsophagus or gullet: such accidents are more common than they are supposed to be; for the ball is often in that part of the œsophagus which lies within in the chest; such cases are incurable, and ought never to occur; for balls when properly made and skilfully given will pass with certainty and ease into the stomach. Balls may also stick in the pharynx, and then they may be drawn out with the hand. Such cases more frequently occur than the former, and from not being understood the ball generally remains until gradually dissolved, or is thrown into the nostrils, where it causes considerable inflammation and such a discharge of matter as has been mistaken for the glanders. Such cases as these I have seen, and I have known them mistaken for glanders.

State of the Stomach.

The stomach of the horse in his domesticated

state is seldom in a perfectly healthy state, and the departure from that state is generally occasioned by the mode of feeding, grooming, and exercising, that is generally adopted. By exercising, the reader is not to understand the work which the animal does; but that want of sufficient exercise by which many diseases are produced. This state of the stomach is one that is easily cured; the cause being removed, the disorder ceases. Another state of the stomach is of a worse and often incurable nature, for it is so gradually induced that its progress is not observed. This is the state which most commonly prevails, and consists in an exhausted state of its sensorial power. This exhaustion may be total or partial. In the former case it is incurable and quickly fatal; the latter exists in a variety of degrees, and produces in consequence a diversity of symptoms or diseases. These diseases are of more importance than any to which the animal is liable, and are less generally understood. Staggers, glanders, farcy, flatulent cholic, inflammation of the bowels and of the lungs, worms and catarrh, are among the number; and these, with strangles and grease, are the diseases which form the subject of the following pages.

Exhaustion of the stomach's sensorial power in the various degrees in which it occurs, may

arise from over-feeding even upon good food, but more frequently from that which is bad or difficult of digestion. Exhaustion of the sensorial power of the stomach may arise from excessive labour, and this is a cause which universally prevails with post and coach horses. Such is the nature of their employment, and so excessive is their exertion, that the stomach cannot digest what is sufficient to supply the waste of the body. Their work is irregular; they have sometimes a day's rest, but the effect which might otherwise result from this is generally prevented by the loaded stomach they are taken out with when they return to their labour: hence arise flatulent cholic, inflammation of the bowels, and sometimes sudden death. Numerous cases of this kind I have met with. Exhaustion of the sensorial power of the stomach may arise from feeding upon indigestible food, and cases of this kind are very common, occurring at grass as well as in the stable. The disorder that has been named stomach staggers is thus produced. Exhaustion of the sensorial power of the stomach may depend also upon abstinence, and this also is frequently occurring. Thus by excessive exertion, want of salutary exercise, over-feeding on wholesome food, loading the stomach with water, and food that is difficult of digestion, imperfect mastication,

imperfect deglutition, and the dryness of the provender, may produce all that variety of diseases which I have briefly alluded to.

It may be necessary to inform the reader that the *digestive organs* have not been treated of in that connected point of view in former editions of this work, as that in which it is my intention now to consider it. In those editions the subjects have been glanders, farcy, staggers, cholic, inflammation of the lungs. In preparing the present edition, these important diseases have again been considered, and in order to give a complete view of the diseases of the digestive organs it has appeared necessary to include worms, cough, roaring, broken wind, diseases of the skin, dropsy of the brain and other parts, frenzy, locked jaw, diseases of the liver, the spleen, and the pancreas.

CHAPTER II.

GLANDERS.

THE nature and consequences of this malignant disease cannot be too seriously considered by all those who have the management of horses. It is the interest of proprietors, no less than the duty of servants, to acquire a knowledge of its earliest symptoms, and to attend carefully to the instructions that are offered, with a view to prevent the spreading of a complaint which is contagious, and has been generally considered incurable.

Cases have been recorded in which medical treatment was said to have effected a cure, especially in the works of Gibson; but he has candidly acknowledged that the cases were more likely to have been accomplished by the care and attention with which the animals were treated for a considerable length of time, than by the medicines which were employed. M. Collaine, Professor of the Veterinary College of Milan, published in 1811 an account of several cures he had effected by means of flowers of sulphur, which he gave in such large doses as to produce the most painful and dangerous symp-

toms. Experiments, however, since made, appear to have proved that M. Collaine, either deceived himself or attempted to deceive the public; in either case he has certainly failed, for it has been found not to possess the properties he attributed to it. M. Malouin, a French practitioner, published an account of some cures he had performed by means of Ethiop's mineral and the herb periwinkle, dried and powdered. But Bourgelat, in his *Matière Medicale*, asserts that he had tried it many times and found it ineffectual. Mr. Smith, a few years since, published an account of some cures he had performed, but his account was not satisfactory. Among the remedies he recommends, several of which are of great power, is Ethiop's mineral, in a dose from half a dram to a dram. He notices some cases which he had cured, but does not state what remedy he employed, but considers attention, with respect to feeding, exercise, and grooming, essentially necessary. Reflections upon the numerous experiments I have made and the cases I have met with, induce me now to declare that I consider the glanders to be curable, not only spontaneously under proper management with regard to feeding, exercise, and grooming, but also by the judicious use of mercury when employed at an early period of the disorder. I am inclined to believe from

some experiments I have made, that glanders may be both cured and prevented by inoculation with the matter of grease or the fluid from the genuine vaccine pustule; not that produced in the human body by inoculation, but by that which takes place on the cow's teat, and which I am satisfied originates, as stated by Doctor Jenner, from the matter of grease, that is, matter produced on the heels of the horse when labouring under the disorder named grease. I have no doubt whatever that inoculation with the matter of grease if carefully performed, would be found an infallible security against small-pox in the human body, and as mild in its operation as the vaccine lymph produced on the human arm.

Symptoms of the First Stage of Glanders.

The first symptom of glanders is a discharge from one or both nostrils, and a swelling of the glands or kernels as they are termed, on the inside of the branches of the under jaw bone. Most commonly one nostril only is affected, and that nostril is generally the left: this is attended with a swelling of those glands only which are on the same side of the under jaw.

In the first stage of glanders the matter is small in quantity, and of a thin glutinous appearance, adhering to the exterior part of the nostril or upper lip, the general health is seldom affected, the horse appears in good condition, and is capable of moderate work. On examining the inner part of the nostril no ulceration is seen, nor is there any offensive smell in the matter; though this has been considered a distinguishing character of glanders, but it does not take place even in the second stage unless the bones of the nose are diseased. In this state the disease sometimes continues several months, and in some instances even for years; the horse doing moderate work, feeding well, and appearing in good condition. In some instances the symptoms gradually disappear, and sometimes permanently. These spontaneous cures scarcely ever take place, unless the horse is of a sound constitution, properly fed, and moderately worked, or when he is turned to grass. But when the disorder attacks horses that work hard, especially post and stage coach horses, or such as are of delicate constitution, or kept on unwholesome food in close stables, its progress is usually more rapid, and the second stage commences.

Second Stage of Glanders.

The second stage is distinguished by a more copious discharge, sometimes mixed with blood, and ulcers are often observable on account of their spreading downwards. In this stage the health often declines, the appearance is indicative of general weakness, and unless supported by a sufficient quantity of good food, and kept from excessive labour, they rapidly fall into decay and die.

In this stage the appearances are various; sometimes the discharge is copious and in such a degree as to impede respiration. In some cases it is streaked with blood, which may be considered as a certain indication of ulcers, though there may be none visible; and when there is an offensive odour it may be relied upon that the cartilages or bones are ulcerated. In some cases the discharge is in small quantity, and only occasionally observed. On exercise it is especially seen, from which it may be inferred that it flows from the frontal sinuses. There is sometimes an appearance of the membrane just within the nostrils which resembles the cicatrix of an ulcer, and has been considered by a late French writer, as a peculiar tubercular appearance, the nature of which was not generally un-

derstood, but that it was characteristic of glanders. I am, however, of opinion that it is the cicatrix of an ulcer, and a certain indication of glanders; especially when accompanied by a swelling under the jaws, and a discharge from the nostrils; whether that discharge be constant or only occasional, from that nostril, from the other nostril, or from both nostrils. Mr. Coleman, as well as French authors, have divided the glanders into chronic and acute, a distinction I have not thought it right to adhere to; for there is not any just foundation for it. Glanders may exist in a great variety of degrees, and so numerous are those degrees that no advantage can be derived from any other distinction than that already named; that is, the first and second stage. The former being known by a discharge only, without any appearance of ulceration, and the latter by ulceration; whether in the lower parts of the nostril and perceptible, or in the superior parts and out of sight.

On the Cause of Glanders.

Hitherto the cause of this destructive disorder has been unknown, or if known has been kept a secret. It is not improbable, however,

that the cause was known to Mr. Prosser. In the year 1770, a pamphlet appeared on the strangles, which it was said resembled the small pox, was subject to the same laws, and curable by the same treatment; that is, by leaving the animal wholly to nature; or in other and more intelligible language, to keep him at grass, at whatever period of the year the disease might occur. The instructions delivered by Mr. Prosser in that pamphlet were not duly appreciated; on the contrary it has been nearly forgotten. I have never seen Mr. Prosser's pamphlet, but from the knowledge I have of his opinions on the subject, it is my duty to make known that they are correct and of great importance. He was of opinion that not only in strangles, but in catarrh also, the animal should be turned to grass. This opinion probably led Mr. Coleman to adopt a mode of treatment in catarrh and inflammation of the lungs, which has proved eminently successful. He has taught this doctrine in his clinical lectures, and his practice has been conformable to it; but unfortunately it has been neglected. I shall have occasion in this volume to speak of it at some length, and I trust I shall be enabled to make it appear that the glanders and the strangles are subjects intimately connected. The glanders, in whatever degree it may exist when

it appears in a discharge from the nostrils, may be considered a constitutional disease, and caused by a poison with which the whole mass of blood is impregnated. This has been satisfactorily proved; first by Saintbel, the first professor of the Veterinary College, who communicated the diseases by giving the matter that had been discharged from the nose of a glandered horse, mixed into a ball with flour to three sound horses. Next by Mr. Coleman, who communicated the disease to a healthy ass by transfusing into his veins the blood of a glandered horse. It has been proved also by inoculating a healthy horse or ass with glanderous matter; for however small the quantity of matter employed may be, or in whatever part of the body the inoculation may be performed, the disease so produced will be a discharge from the left nostril, and a swelling of the glands under the jaw of the same side. To those who have not reflected upon the subject, it may appear strange that the *left* should be the nostril most commonly affected in glanders; but reflection will shew that the *left side* of the animal is in all diseases the part which generally suffers; and that too for a reason which the reader may discover when he considers that there are duplicates of the different parts of the body, and that one is more exercised than the other; that the latter

may be reserved in case of accidents to the former: thus it is in the eyes, the ears, the nostrils, and other parts. The glanders then is a disease which depends upon the existence of a peculiar poison in the blood, and it has been proved by the experiments already noticed, that it may be produced by transfusing glanderous blood into the veins, by swallowing glanderous matter, and by inoculation. That glanders (but of a spurious kind and not contagious, though often fatal) arises from other causes besides those above noticed, is generally known and has been severely felt: but what those causes are has not hitherto been distinctly made known. It has been supposed that unwholesome food and hard work, assisted by a frequent variation of temperature, or close, unventilated stables, will produce the disorder; but these causes alone are not sufficient, nor will they, in whatever degree they may be employed, produce the disease. Weakness, however produced, is favourable to the reception and progress of glanders, and the readiness with which it is received is proportioned to the degree in which that weakness exists. This constitutional weakness is especially observable in the ass; for so remarkable is it in this animal, from habitual ill usage from time immemorial, that he is now become, though properly fed, more susceptible of morbid im-

pressions than any other animal. It is from this cause that asses suffer so much when made the subjects of experiments; and for the same reason when inoculated with glanderous matter, they are infected in such a degree as to have the acute or second stage of the disease, which proceeds so rapidly, that they generally die of it in two, three, or at most four weeks. The cause of glanders, which has been so long unknown, but suspected by many, is *suppressed strangles*. This opinion has been held both by French and English authors, but the manner in which they have spoken of it has failed in producing the effect which it ought,—a conviction of its truth and importance. Had it been generally known and properly applied, it would have led to the extinction both of glanders and strangles.—Thus I have ventured to state in positive and distinct terms, that the glanders is caused by swallowing glanderous matter, by accidental or intentional inoculation with glanderous matter, and (but of a spurious or non-contagious kind) by suppressed strangles.

EXPERIMENT I.—*Inoculation.*

A bay mare, five years old, in good condition, had a slight discharge from the left nostril, and

a hard swelling under the jaw of the same side. This mare was supposed by the owner to be labouring under the strangles, but as there was neither cough, dulness of the eyes, or any of those symptoms which usually attend the strangles, I was induced to consider it as a case of chronic glanders, or the first stage of that disorder. The swelling was blistered, and some opening medicine given; but at the end of a fortnight, as no alteration had taken place, an ass, two years old and in good condition, was inoculated with the matter on one side of the neck. At the same time there was a poney belonging to the same person, and standing in an adjoining stall, that had an inconsiderable discharge from both nostrils, and a very slight degree of swelling under the jaws; so inconsiderable was the discharge from the nostrils, that it would not have been observed were it not for the circumstance of his standing next the mare. Some matter was taken from the nose of this poney, with which the ass was inoculated, on the other side of the neck. In two or three days both the inoculated parts ulcerated, the lymphatics going from it were swollen or corded, as it is termed, and small tumours similar to farcy buds appeared in their course. The original ulcer spread, others appeared in the course of the swollen lymphatics, and in about a week a

very slight discharge was observed from the left nostril, so inconsiderable indeed, that it would have escaped notice had it not been particularly attended to; and there was a small degree of swelling under the jaw on the corresponding side. The discharge and the swelling increased, and in little more than a fortnight the animal was decidedly glandered. Numerous experiments of this kind have been made, and the fact of the glanders being so communicated is so completely established, that professional men have employed it as a *test* for determining the nature of those slight discharges from the nostril, which, being unattended with cough or any other symptom of a catarrh or cold, could not be otherwise ascertained. It will be shown, however, in another chapter, that this *test*, which I have considered as a valuable discovery, and have therefore noticed it as such in my former publications, is now rendered unnecessary by one still more valuable; that is, a *cure* for the glanders, and a method by which it may be with certainty prevented; not by keeping a horse out of the reach of contagion, but by a simple process which will be described in the following pages.

On the Prevention and Cure of Glanders.

It has already been observed, that suppressed strangles will produce glanders, but of a spurious kind, and non-contagious; I have now to add to this observation, that strangles is capable also of preventing glanders, and I am inclined to believe that if properly applied, it will be found also to cure it. Strangles I am induced to consider as a process instituted by nature for depurating the blood of colts. In a state of nature this process takes place and goes through its course with so little derangement of the animal's health, that it generally passes unnoticed. The period at which it happens is between the third and fourth year, before which time a colt should never be taken from grass. This precaution, however, is seldom observed, and too frequently they are brought into the stable and even put to work before the third year. Thus the strangles often takes place in the stable, where this salutary process being interrupted by the heat of the stable, and stimulating qualities of his food, as well as by the injudicious interference of art, a complete depuration does not take place, and the animal is rendered liable during his life to that disorder which has been named *spontaneous glanders*. If a horse that has

been thus imprudently taken from grass before he has had the strangles (and if he is taken up before he is four years old there is danger of this being the case, and even a probability of its being so), be inoculated in any part of the body with matter from the heels of a horse labouring under the grease, he will be permanently secured from the glanders, in whatever way he may be exposed to the contagion. The experiments I have made on this interesting subject are but few, but sufficient to convince me that what I have asserted, and am about to assert, relative to glanders and strangles, is true. The matter to be employed for this purpose needs not to be described; the disease named grease is well known, and the reader is referred for any information he may require on the subject, to my compendium or first volume.

Thus may the glanders be effectually prevented, and would the breeders or proprietors of horses act in a manner consistent with their own interest, and not take the animal from grass until he was capable of labour, that is, until he had completed his fourth year, he would be secured from a destructive malady; and were the practice universal, the disease would be completely extinguished. If matter from the heels of a horse labouring under the grease will prevent the glanders, and if the strangles will

produce the same effect, whether it take place spontaneously, or be produced by inoculation with matter taken from the nostrils of a horse that is already affected with the disorder (for it may be so produced in a colt, as has been satisfactorily proved by Mr. Prosser), there will be no difficulty, I trust, in believing that it will also cure the glanders, if employed at an early period of the disorder. It is now necessary to observe that glanders may be local as well as constitutional. The former occurs on the superficial parts of the body, as ulcers or small tumours, and is named farcy. The latter always appears at the nostrils. In order to ascertain whether the disorder be in that recent or early stage in which it is curable by inoculation, it is necessary to examine the glands under the jaw; for if the swelling be small, soft, moveable, and free from tenderness, then the disorder is curable by inoculation, either from the heels of a horse affected with grease, or from the nose of a horse that has the strangles. It is now time to describe the effect that is produced by inoculation with the matter of grease and of strangles, as from the description that has been given of the glanderous inoculation, some apprehension may be entertained of a similar effect from these.

The *grease* matter I have employed has been that fetid, dark-coloured matter, which is dis-


charged when the disease has existed some time, and is in what is called its confirmed stage. In this stage of the disorder the hair of the affected heel is erect, staring, or furzy, as it is commonly termed; there is much swelling, and the pain is so considerable, that when the horse is moved in the stall he draws up his leg suddenly, and keeps it up a short time as if he were cramped. I think it probable, however, that the matter discharged in the milder or more recent cases of grease would be equally effectual. The inoculation is performed with a small lancet, such as is employed for inoculating with the small pox, and it may be sufficient to add that the operation is performed in a similar manner; but as this book is designed for general use, a particular description will not, I think, be thought superfluous. Let the hair be cut closely off from a small spot on the buttocks, the neck, or any other part of the body that may be considered more convenient. A small portion of the *cuticle* on this bare spot is to be raised with the lancet, without wounding the skin, but so close to it as to produce about one drop of blood, (this, however, is not absolutely necessary; an abrasion of the cuticle will be sufficient.) This blood is to be wiped off, and then a small quantity of matter is to be placed on the lancet, or the lancet having been dipped in the

matter, is to be again introduced into the part it was taken from, gently pressed on the skin and then withdrawn. Four days after the operation a small bladder or vesicle will appear, similar to that produced by vaccination in the human arm; this will go through its course exactly in the same manner as the vaccine pustule, and be attended with similar effects; for the constitution will be effectually secured both from strangles and from glanders. If the operation be negligently or roughly performed, and more matter inserted than is necessary, a corresponding effect will be produced both local and constitutional. A very painful sloughing tumour may be produced, similar to a carbuncle. The same difference is observable in glanderous inoculation, when performed in the manner in which vaccination ought to be performed; the local effect is inconsiderable, and the progress of the disorder is proportionably slow. In two experiments where tow soaked in glanderous matter was introduced under the skin as a rowel, the animal was speedily destroyed before any local effect was observable. In many experiments in which the operation was roughly performed, either from carelessness or design, the local effect has been considerable, the progress proportionably rapid, and the glanders has been quickly produced. By reflecting on this cir-

cumstance I have been led to a recollection of a pamphlet on inoculation of small pox by Sheldon. This eminent surgeon was of opinion that when variolous matter was introduced by inoculation it acted as a ferment or leaven in the blood, thereby engendering a peculiar poison similar to itself, which, spreading through the mass, was conveyed to the different surfaces of the body and appeared in pustules, which burst and gradually disappeared, leaving the constitution unsusceptible of a similar disorder. He asserted that the local and the constitutional effect was proportionate to the *quantity* of matter introduced, influenced however, and that in a most important manner, by the temperature in which the patient was kept. The illustrious Sydenham advised the patient being kept in the open air, and he may have added, I believe, even in winter. In the pulmonary diseases of the horse, whether it be inflammation of the lungs, catarrhal fever, influenza, or epidemic catarrh, more commonly called distemper, the open air, even in winter, is the best situation the animal can be placed in, provided he is sheltered from the rain. This was first proved by Mr. Coleman, and has been confirmed by some other veterinary surgeons.

In reflecting on the experiments I have made, and on Dr. Jenner's opinion that the matter of

grease is the origin of cow-pox, and might be employed for inoculation as a preventative of small pox, I cannot but believe that it would be found a more certain preventative than the modified or altered fluid that is now used for the purpose. Inoculation with the fluid from the genuine pustule of the cow's teat has never been found to fail: that from the pustule of the human arm has failed, continues to fail, and the failures appear to be increasing. To what can we attribute this lamentable circumstance, but to the gradually increasing deterioration of the vaccine fluid?



On the Cure of the Second Stage of Glanders.

In several experiments that have been made on this subject, it has been proved that mercury has considerable influence upon the disorder. Sublimate has been more frequently employed than any other preparation, but such is the debilitating effect of this medicine that it is only in a few instances that its curative power has been clearly demonstrated. That it does possess this power has been sufficiently proved; but in numerous experiments that have been made on glandered horses, with sublimate, calomel, and other mercurial preparations, the symptoms have been

generally increased, and the horse's death accelerated. They not only produce an alarming degree of general debility, but by their continued action on the kidneys, they enlarge and soften them, and often produce a partial or complete disorganization of one kidney, especially that on the *left* side. Since mercury has been proved to possess this power, why should we not employ that preparation which is most easily and cheaply made, and has been found on all other occasions by far the most innocent? Saintbel, in his numerous experiments on this subject, clearly proved that mercury might be introduced into the blood by rubbing mercurial ointment on the buttocks and other parts from which the hair had been removed by shaving or cutting it off with scissars. The quantity he rubbed in at a time was one ounce, and thereby produced in twenty-four days a profuse salivation, which so increased the disorder that the animal soon died. Here then we have a proof of the blood being impregnated with mercury by the use of mercurial ointment, though employed in a quantity which destroyed the animal. Had Saintbel rubbed in only one dram instead of one ounce, and had he continued it only until he was satisfied that it had entered the blood and assisted its curative operation by supporting the animal's strength with a nutri-

tious diet, such as would be easy of digestion, and not oppressive to the digestive organs, he would, in my opinion, have cured the disorder without injuring the animal's health. Should this mode of applying mercury be objected to from the trouble and inconvenience which attend it, and from the time which may be supposed necessary for its introduction into the blood, the mildest preparation may be given with the horse's food, such as the blue pill or the quicksilver with chalk. Ethiop's mineral, I am inclined to believe, would be sufficiently active to cure the disease, if given once or twice a day in the dose of a dram with the horse's food. Saintbel tried it in the dose of one ounce, with an equal quantity of an inert vegetable named periwinkle, preceding its use by a strong purgative, he employed at the same time injections, which were thrown into the cavities where the matter was lodged, through openings made in the bones for the purpose. In this he adopted the method proposed by Lafosse; that is, he trepanned the animal and syringed the affected cavities, knowing that the nostrils cannot be effectually syringed in any other way.

The medicine was not given daily, but after considerable intervals, and each dose was preceded by a cathartic. In this way it may be

supposed it did no good, and such was the result. That mercury can cure the glanders has been proved, and it now remains to be ascertained in what quantity it must be employed for the purpose, and whether the preparations I have named, that is, blue pill, quicksilver with chalk, and Ethiop's mineral, which in my opinion are nothing more than the metal itself in a state of minute division, are not sufficient for the purpose. If they should prove sufficient for the cure of glanders in the small dose I shall soon point out, without diminishing the horse's strength materially or deranging his general health, then will the desideratum so long sought after be found, and the opprobrium veterinarii, as it has been termed, will cease to exist. Ethiop's mineral has been objected to, from a supposition that the sulphur formed a chemical combination with mercury, and rendered it so inactive as to be unfit for impregnating the blood; but this is an error. This, with the persuasion that sulphur is an antidote to mercury, when that metal or its preparations has been given so as to produce a violent salivation and other dangerous effects, has been the cause perhaps of preventing the use of this simple and valuable preparation, for such I consider it, and therefore recommend it in preference to every other. Next to Ethiop's mineral,

I would advise the use of quicksilver with chalk, provided it is properly made; but sufficient labour is seldom afforded, and this is an objection to its use. The blue pill will answer the purpose, but cannot be so readily mixed with the food as Ethiop's or the mercurial chalk. The dose of the blue pill is half a dram; of mercurial chalk and Ethiop's one dram. Of the chemical preparations of mercury or quicksilver, that which is made by washing calomel with liquid ammonia is the best, because it is the most innocent, or, in other words, the least poisonous. If the other preparations of quicksilver, such as calomel, and more especially sublimate, should continue to be used, they should always be combined with opium, and their pernicious quality guarded against by a suitable diet, and such exercise only as the animal will voluntarily take when turned into a large box, or, what is better, a paddock. But I venture to indulge a hope that the plan of cure and prevention I have recommended will be fairly tried, and then those preparations will be rendered unnecessary. The part where mercurial ointment should be rubbed in, is the inside of the thigh near the belly. The criterion for determining when it has entered the blood vessels, is the offensive or foetid smell of the breath. As the horse's breath comes only from the nostrils, the smell may be

supposed to arise from the matter which is discharged; but glanderous matter has not an offensive smell, unless the bones are ulcerated or carious, which takes place only in the last stage of the disorder. When the mercurial effect has taken place, it should be kept up by continuing the use of the mercurial preparation until the discharge from the nostril ceases; and if this should not happen until he is weak and stales considerably, or becomes loose in his bowels, or disordered in his stomach, opium, mixed with a cordial or stomachic ball, should be given, so as to counteract those effects.

CHAPTER III.

ON THE FARCY.

THE farcy is a disease of the skin which generally follows the course of the superficial veins. It appears most commonly in the form of small tumours or buds, which are at first hard but very tender, then burst and discharge matter mixed with blood, and degenerate into ulcers which sometimes spread considerably and assume a peculiar appearance, becoming abrupt in their termination, appearing as if their edges had been cut round with a knife, and afterwards a little thickened, unlike the common sore which terminates gradually and smoothly with little or no edge. The surface of the farcy sore is pale, smooth, glossy; the matter on its surface being thin and transparent. The surface of the common sore is of a red colour, rough or granulated, and covered with white matter or pus. The parts adjoining the farcy sore are swollen and tender; corded veins, or lymphatics and buds, similar to the original tumour, making their appearance in a direction towards the centre of circulation—the heart. The common sore is not attended with those appearances, for if the

surrounding part participate in the injury which produced it—the swelling generally surrounds it uniformly, without any corded lymphatics, as in farcy. In farcy there is a subtil poison, which, passing into the lymphatics, inflames them, makes them swell or appear corded; these vessels having valves similar to the veins, when the poison arrives where they are situated, after a small portion has passed forward inflammation takes place, then suppuration, and that vessel is obliterated. Numerous other vessels going from the sore receive the poison and become obliterated in like manner. By the farcy sore is meant that where the disorder begins, and from its smallness often escapes notice, being generally produced by a currycomb which has been used in cleaning a glandered horse. This sore then is precisely the same as the glanderous inoculation, pursues the same course, and is attended with similar consequences; producing a discharge from the left nostril, and a swelling of the glands under the jaws on the corresponding side; that is, it produces the glanders, the disorder from which it was derived. Thus farcy and glanders are symptoms or effects of the same subtil poison: in the latter being mixed with the whole mass of blood, and in the former applied to the skin. The farcy is most frequently produced by the currycomb, as before described, either

in the legs, the neck, or other parts of the body, but especially about the legs and hocks, where the parts are prominent and exposed more to such injuries. It is produced also on the lips by means of the twitch; for after the application of this instrument, the horse rubs his nose and lips with violence against the manger, and sometimes wounds himself with a glandered splinter. Thus then, the farcy and glanders are symptoms of the same disorder, and are curable by the same means. Mercury is the specific, and the only one, except that which has been provided by the Almighty—the strangles and the grease. These, if employed as they were designed to be, will both cure and prevent those disorders; but when the animal is brought into the stable, some directions will be necessary for their effectual application. It should have been observed with regard to farcy, that if the primary sore or inoculated part can be discovered, it cannot be attended to too early; for however small it may be, the poison rapidly increases by a kind of fermenting process, spreading and diffusing itself through the lymphatics; but if lunar caustic be freely applied to its surface, the sore will be speedily cured and the source of the poison destroyed. That minute quantity, however, that cannot be prevented from passing into the blood, is sufficient to impregnate the whole

mass; this however takes place gradually; for the poison when it arrives at the heart, acts as a leaven upon the blood, gradually increasing till the whole mass is imbued with its baneful influence, and when this has acquired a sufficient degree of power the glanders appears at the nostrils. Here a method has been provided for suspending the fatal or destructive process, for the poison flows off with the matter at the nostrils as quickly as it accumulates. If the vital power be diminished by want of food, unwholesome food, or hard work, the drain which nature has provided becomes insufficient, the poison gradually accumulates, acquires force, till at length it falls upon the vital parts and the animal is quickly destroyed. If on the other hand the horse is properly fed and taken care of, and worked with moderation, the vital power becomes superior to the poison, which, instead of accumulating, is gradually expelled from the system through the nostrils. Many instances of this I have met with, especially in the glandered teams of Mr. Russel, of Exeter. There the horses were well fed and worked with moderation. No feeding or care, however, will enable the animal to go on long when worked hard, as is seen in post and stage coach horses. The work which such horses are employed in is of that nature that the waste or expenditure of the body cannot be sup-

plied by the most nutritious diet; hence it is, that the glanders commits such ravages when it gets among horses of that description, while in waggon horses that are properly fed and worked with moderation, it often ceases spontaneously. How fruitless and absurd then must those attempts be to cure the glanders, by pouring stimulating fluids into the nostrils; for finding that the fluid could not be effectually injected with a syringe, the nose has been drawn up by means of a pulley fastened in a beam, and the solution of blue vitriol or other stimulating fluids poured into them with a horn. By such means the discharge has sometimes been suppressed, but after a short time the poison accumulates, and produces an inflammation of the heart, which proves fatal. Instances of this I have seen, and such cases are generally mistaken for inflammation of the lungs or bowels. Bleeding affords no relief in such cases; on the contrary, it hastens the animal's death. The matter produced by the secondary farcy sore or bud, is not sufficiently active to produce glanders, whether applied by inoculation or swallowed. In the former way it produces an ulcer of a suspicious appearance, which I formerly mistook for a farcysore; but such sores gradually heal spontaneously. Let every one then who is concerned with horses, take care when he makes a

purchase that he chooses such as have had the strangles, which may be known by a cicatrix under the jaws; without this mark he will be liable to the glanders, not only from contagion, but from those other causes which have been already noticed; that is, unwholesome food, hard work, and general bad management. In mesenteric consumption, or atrophy, there sometimes is a discharge from the nostrils, which has been mistaken for glanders; but there is no swelling under the jaws, and the disease is not contagious. Nothing but grass can cure this disorder, and that only when it is employed at an early period.

Having described what may be called the genuine or glanderous farcy, I shall proceed to notice a spurious kind, in which the action of the poison appears to be so modified by the *grease*, that it is generally easily cured, and often ceases after a time spontaneously. I have met with cases of this kind, and have seen mercury, given internally, produce the most decisive effect upon the sores, without the assistance of local remedies. The symptoms of this kind of farcy have not that appearance of virulence that is observable in the glanderous farcy. Œdematous swellings in the extremities are often named water farcy. The remedy that has been prescribed for glanders will not be found sufficient; a run at grass, or diuretics, with to-

nics and good food, are most effectual in this disorder. The sores, in the modified farcy, should be kept clean, and washed with solution of blue vitriol; and when the weather is favourable, the horse may be turned to grass. It will be necessary, however, to assist this treatment by Ethiop's mineral, or the other preparations I have recommended.

CHAPTER IV.

ON THE STRANGLES.

THE strangles is a disease which the Almighty has given to the horse for the wisest and best of purposes ; that is, to depurate his blood, and secure him against that most destructive disorder—the glanders. The strangles occurs between the third and fourth year, and produces so little inconvenience to the animal, that it generally goes through its course unnoticed. If he is taken up before this period, and put to work, the disorder seldom appears in its perfect form, and the depuration, instead of being perfect, is incomplete, and leaves the horse liable to many disorders, among which are bastard strangles, quinsy, catarrh, periodical inflammation of the eye, and glanders. Since horses, then, are almost universally deprived of the benefit which was designed for them by this salutary process, we should endeavour to compensate for it by treating them with care and humanity ; by allowing them a sufficient quantity of wholesome food, and allotting them such a portion of labour only, as they are competent to perform. In doing this proprietors would be

consulting their own interest, as they might thereby avoid the loss and inconvenience they now so often suffer from the interruption to the animal's labour that is frequently occurring; from the expense that is incurred from attempts too often made to cure incurable disorders, and from the serious losses sometimes sustained by the ravages of glanders, and other contagious diseases.

Were horses permitted to go through the strangles at grass before they are employed in labour, they would not be susceptible of catarrh, nor of that epidemic disease, named distemper, which at times has proved so destructive. What then, it may be asked, can be done when this salutary precaution has been neglected? When a horse is attacked with strangles in the stable, the best, the only effectual thing that can be done, is to put a seton under the jaws, and turn him to grass. This, if the horse be young, and the constitution not materially injured, will be a preservative in a certain degree, but is far from being so efficacious as the natural process. Whenever young horses, therefore, have a catarrh or cold, attended with swelling, however slight, under the jaws, instead of bleeding freely, as is commonly the case, a seton should be applied, and the horse turned out. The mischief that has been done by bleeding young

horses in incipient or imperfect strangles is beyond calculation; and yet there are diseases of the catarrhal kind, in which early and copious bleeding is an essential remedy. In incipient strangles, the swelling under the jaws is at first inconsiderable, the eyes are dull, there is always cough, and from the tonsils being inflamed, which indeed is the primary seat of the disorder, there is more or less of difficulty in swallowing. Blisters are generally employed to remove this symptom, and sometimes they succeed, but they do not accomplish that salutary process of depuration for which the disease is designed. It is only by passing a seton, smeared with blistering ointment, that a sufficient degree of inflammation and suppuration can be produced to afford effectual assistance to the efforts made by nature for discharging this morbid leaven from the blood. In speaking of the pernicious effects of copious bleeding in incipient strangles, I mean only in cases where the animal is weak and in low condition, or when the cough and inflammatory symptoms are inconsiderable. Sometimes the inflammation of the throat is in so high a degree, that unless the horse is freely bled, there is danger of inflammation of the lungs and suffocation; and in some cases bronchotomy, or an opening in the windpipe, has been found necessary.

When the swelling under the jaws is more considerable than that I have before described, and attended with difficulty in swallowing, the usual practice is to blister the swelling in order to hasten suppuration, but this may be more certainly and speedily accomplished by passing a blistering seton through the centre of it. If the horse cannot be turned to grass, green food should be procured for him, and he should be turned loose into a cool stable, or some other place of a similar kind. Steaming the head with hot bran mashes is a useful practice in strangles, as it promotes the discharge of matter. Physic has been thought necessary after a horse has recovered from strangles; but a run at grass, or grass in the stable, is more useful.

CHAPTER V.

ON THE GREASE.

THIS disease consists in a discharge from the heels, attended with swelling, and often with considerable pain. The discharge is of a peculiar nature, and like the matter discharged from the nose in strangles, has the property of preventing and curing the glanders, provided the horse is afterwards properly managed with regard to feeding and labour: for it should never be forgotten that inoculation with the matter of the nose in strangles, or the matter of grease, will secure him against the contagion of glanders only, and not against that which is produced by the improper feeding and excessive work. This wonderful property of the matter from the heels of a horse affected with grease may lead to a conjecture that the disorder was designed by the omnipotent Creator of the universe as a preservative against other more dangerous or fatal disorders. May not the matter, when deposited on the grass, be swallowed by the cow, and through the medium of the blood, produce the vaccine pustule; and may not that disorder in the cow be a preservative against

others of a different and more dangerous nature? The fluid from the *pustule* of the cow's teat has been a source of incalculable benefit to mankind; and if vaccination as now performed so often fails, as it is said to do, may not such failures be wholly prevented by employing the matter from the cow's teat, instead of that from the pustule of the human arm? For my own part, I cannot but believe that inoculation with the matter of grease, would be found as effectual a preventative of small pox, as inoculation with vaccine lymph, or even with variolous matter. The grease may exist in a great variety of degrees: sometimes inconsiderable, and causing but little pain and inconvenience to the animal; at others, extremely painful and attended with considerable swelling, and a discharge of stinking matter. The more frequently the horse has this disorder, the more disposed to it does he appear to become; and in virulent or confirmed cases, it is evidently connected with a debilitated state of the constitution. In such cases, excrescences sometimes appear on the heels, extending above the fetlock joint; and in summer maggots are often engendered in them, unless cleanliness is attended to. A run at grass is the best remedy for grease; but if this cannot be submitted to, then an emollient poultice should be applied, renewed twice a day, and continued

until the disease is cured. This is the only remedy that is necessary, nor should the poultice be left off until the discharge from the heels has entirely ceased; or, in other words, until the disorder is cured. The foetid matter of grease is an impurity that previously existed in the blood; and if not thus discharged, will be productive of other disorders. Inveterate grease has been sometimes quickly cured by sublimate, or blue vitriol, dissolved in water; and in some instances no other disorder has resulted from it. It more frequently happens, however, that when the discharge in grease has been thus suppressed, disorders of the eyes, the lungs, the bowels, or the kidneys, have been the consequence of it. If a horse, affected with grease, cannot be turned out, he should be kept loose in a stable, or large box, where he may move about, and have a little exercise, and be fed moderately with hay and oats.

CHAPTER VI.

ON INFLAMMATION OF THE LUNGS.

INFLAMMATION of the lungs may be either pleuritic or catarrhal. Pleuritic inflammation is produced when a horse is taken from grass and put without suitable preparation into a stable. The change which takes place on this occasion is two-fold; that is, in temperature and in food. Too frequently another change is added to these, and that is from voluntary exercise to hard work. Other diseases besides pleuritic are thus produced. Hence arise molten grease, inflammation of the bowels, the lungs, the brain, and other vital organs. The symptoms which precede pleuritic inflammation must be carefully attended to, which are heaviness and dulness of the eyes, and especially a *redness of the inner surface of the eyelids*. This redness may be considered as a characteristic symptom of internal inflammation, and denotes that bleeding in large quantity is a necessary operation, and affords a criterion by which we may determine with certainty when a sufficient quantity of blood has been taken off. Until this appearance is removed, or considerably diminished, it may be

considered certain that a sufficient quantity has not been taken off. I have met with cases where bleeding has been carried so far, that the animal could not bear the loss of any more; and has, notwithstanding, died. Such cases were rendered incurable before I was consulted, the animals having been ridden, or employed in their usual labour, after the preceding symptoms had made their appearance; and probably after the disease itself had commenced. How necessary, therefore, must it be to attend to those symptoms, especially when a horse has been lately taken from grass, and how necessary also to bring about that change as gradually as possible, and thereby prevent their occurrence.

Such are the preceding symptoms of pleurisy, and if not relieved by sufficient bleeding they rapidly increase. The animal becomes very uneasy, often looks round to his sides, generally to the left side, that being the first that is attacked, for reasons already assigned (see *glanders*). Breathing becomes quick, and at length laborious, which may be seen by the motion of the flanks and nostrils. The difficulty of breathing is such that he is obliged to stand in order to support the muscles of respiration, and afford some relief to his pain. After a short time, when the only remedy is withheld, that is, bleeding, he drops down and dies. When inflam-

mation of the pleura has taken place, it rapidly spreads to the lungs, and becomes what is named *peripneumony*. This nominal distinction may be preserved, but is not essential. In slight attacks of pleurisy the disease has sometimes terminated in adhesion of the lungs to the inside of the ribs. This often happens to animals at grass, especially to cattle when put in a state of poverty into good pasture, and they recover spontaneously. This circumstance, if properly reflected upon, will show, what has been proved true by Mr. Coleman, that a field or the open air is the best situation for an animal labouring under inflammation of the lungs; for even a slight attack in the stable, if not suppressed by timely bleeding, often increases rapidly and terminates in death. If then the omission of bleeding, when the preceding symptoms of pleurisy have taken place, is likely to be attended with fatal consequences, what can be expected if a horse is worked while labouring under those symptoms? it renders bleeding and all other remedies useless. The vital power is thereby so exhausted, that the animal is speedily destroyed by the disorder. In such cases it will be found that the redness of the inner surface of the eyelids will continue notwithstanding the most ample bleeding is employed. With respect to the repetition of bleeding in inflamma-

tion of the lungs, the practitioner must be guided by the following circumstances: when the animal is in good condition, and the strength not previously exhausted by hard work or otherwise, the quantity of blood necessary to be taken off is from six to eight quarts, or even more; when this has been done, a repetition of the operation is seldom necessary. Sometimes, however, the disorder will again acquire strength after the bleeding, and render a second, a third, or even a fourth, absolutely necessary. The appearance of the blood drawn, after it is coagulated, should be attended to, but the redness under the eyelids is the best criterion, and cannot lead the practitioner astray; for though it may sometimes continue after as much blood has been taken off as the animal can bear, it shows that the disease was, previous to the bleeding, absolutely incurable. Let the appearance, therefore, of the under surface of the eyelids be carefully observed not only in inflammation of the lungs, but in all other cases of internal inflammation. The remedies I now recommend as auxiliaries to bleeding are *setons* under the jaws, in front of the chest, under the chest, and under the belly. These I consider to be preferable to rowels, and more safe and effectual than blistering the sides. The setons should be made of coarse tape about one inch in width.

The length of tape passed under the skin should be from three to six inches, according to the situation of the part; the tape should be smeared with simple ointment of cantharides; the tape at each end should terminate in a knot, and not be tied to each other, as is commonly done; the ends should be of sufficient length to admit of the tape being moved to and fro, which should be done daily, after a perfect suppuration has been established. The medicine to be employed should be composed of nitre one ounce, antimonial powder one dram, flour two drams, hard soap, that has been melted by standing in a gally pot upon a hot plate or fire-pan, a sufficient quantity to form the ball. This is the only medicine that is necessary, and should be given twice a day as long as the symptoms continue. It may not be superfluous to observe that setons may not be so essential a part of the treatment in pleuritic inflammation of the lungs as in the catarrhal, yet they are useful, especially in severe cases, and therefore should not be omitted. With regard to the state of the bowels, should they appear to be in a torpid or inactive state and the dung hard or slimy, emollient clysters and a ball composed of three or four drams of aloes, and an equal quantity of soap, should be given. A strong cathartic would be dangerous, and might be productive of fatal consequences.

CHAPTER VII.

CATARRHAL INFLAMMATION.

CATARRHAL inflammation is a disease of the mucous membranes of the nose, the throat, and the lungs, and is sometimes epidemical and contagious. It begins with cough, dulness or watering of the eyes, diminution of appetite, and general languor, and is succeeded by a discharge from the nostrils. This discharge is sometimes inconsiderable and unnoticed; at others it is more copious, and even profuse. In some cases, and especially in the epidemic catarrh, as the symptoms increase a considerable degree of debility takes place, and the discharge from the nostrils is such as to excite apprehensions of the horse being glandered. The throat is sometimes sore, and in such a degree as to prevent swallowing. Matter is thrown out of the nostrils by snorting, especially after coughing, which denotes an affection of the mucous membrane of the lungs; for as the horse breathes only through his nostrils, the matter discharged from the lungs must necessarily pass through these cavities. Sometimes indeed, a small quantity is thrown off by the mouth, but the nostrils

are the part through which it is generally discharged. As to the treatment of catarrhal inflammation, whether it be a simple catarrh or cold, quinsy, or sore throat, epidemic catarrh or distemper, or catarrhal fever, it is extremely simple, and in all these varieties precisely the same; that is, setons in the throat and the chest, and turning the animal to grass. At whatever time of the year these disorders may occur, except in wet weather, the animal should be turned out and kept at grass as long as the disease continues. If the weather prevents his being turned out, he should be kept in a cool stable, and fed with grass. If this cannot be procured, bran mash may be given.

The treatment of a horse when kept in a stable and on dry food, is somewhat different from that I have now described. Here bleeding is always necessary, and that too with considerable freedom; when the inflammatory symptoms or fever run high, six, seven, or eight quarts may be taken off with advantage. In this complaint, as in pleuritic inflammation, the under surface of the eyelids must be carefully observed; for by this criterion, together with the breathing and quickness of the pulse, the treatment, as far as bleeding is concerned, must be wholly regulated. In the stable the state of the bowels also requires attention, and

should opening medicine appear necessary, the ball with aloes, prescribed in the preceding chapter, and emollient or laxative clysters should be given: after this the other ball may be given twice a day. Setons must never be omitted, and the discharge should be promoted by steaming the head. Thus we see that in catarrhal inflammation or fever, whether of the mild kind, named cold or catarrh, or the epidemic kind, named distemper or influenza, or when occurring with the greatest severity, turning to grass with setons is an effectual remedy. The use of setons in epidemic catarrh was first suggested by Osmer, who published some valuable observations on the subject about the year 1750, when a dreadful epidemic prevailed which destroyed an incredible number of horses and cattle. Before this time epidemic or epizootic diseases, were considered as putrid diseases, and stimulating medicines were employed with a view to correct putridity, under the name of alexipharmics, antiseptics, tonics, &c. Osmer finding this treatment unsuccessful, had recourse to rowels, setons, and diuretics, and in consequence he succeeded in an eminent degree. This epidemic, as well as others of former times, was of a far more favourable nature than any that have appeared in the present time. The worst epidemic I have ever seen occurred in the year

1798, at which time I was not aware of the efficacy of the simple mode of treatment now recommended, that is, turning to grass, and setons; but the treatment employed was successful, and was nearly the same as that I have now recommended as *stable treatment*; that is, early bleeding, nitre, steaming the head, cool stables, and occasionally rowels. The troop horses were examined every morning, and the disease attacked at its commencement. An immense number of horses died of this distemper in the district I was quartered in, and other parts of England, but in the Royal Dragoons, the regiment to which I belonged, not a single horse died; but by this early attention they soon recovered and became fit for service. This epidemic occurred in the summer.

Gibson has observed, in speaking of catarrh, that “so far from proving deadly, with proper care they tend greatly to the improvement of the horse’s health and constitution, and render such horses more hardy and durable afterwards, and recover many horses to perfect soundness that before were full of complaints.” Strangles is attended with the same beneficial consequences, rendering him unsusceptible of glanders and of some other diseases, or so modifying or changing their nature as to render their existence of short duration, when the animal is

properly fed and taken care of or kept at grass. The matter of grease has the same beneficial effect, both on the horse affected with the disorder, and those who may be inoculated with it or receive it into their blood through the medium of the stomach.

Epidemic catarrh, strangles, and grease, are to the horse what small pox is to man;—a preservative against other diseases. Small pox, or rather the predisposition to the disorder, is an infliction of Divine Providence for excessive indulgence in venery or criminal practices, and this predisposition is got rid of by that depurating process which is called small pox, and the matter thus thrown off on the skin communicates the disease to others in a manner that has not hitherto been satisfactorily explained. This matter forms an atmosphere around the morbid subject sometimes of considerable extent, and peculiar malignancy, especially in warm unventilated rooms, or in the open air when the weather is warm, and there is not much wind; thus it is that it becomes so virulent and destructive as it has sometimes been found; for the violence of the disorder is always proportioned, *cæteris paribus*, to the quantity of the poisonous matter taken into the *stomach*; for the blood is not impregnated with the disorder through absorption by the skin or the lungs, but the saliva mixes

with the small pox effluvia, and passes with it into the stomach. The poison of grease, of strangles, and of catarrh, is communicated somewhat differently; they are active only in the fluid form and combined with mucus, which being taken into the stomach is conveyed by the lacteals into the blood. It is only in this way that the diseases named small pox, grease, strangles, and catarrh, are propagated, except by artificial means, that is, by inoculation. Here then we may observe a striking similitude between those diseases: they are all communicated through the stomach, and are preservatives against other disorders. In like manner we may observe a remarkable analogy between the venereal disease and the glanders. If applied to a mucous surface, such as the urethra, an increased secretion of mucus is produced of the same poisonous nature. If applied to the skin where the cuticle has been abraded or wounded, an ulcer, termed a chancre, is produced, and precisely of the same appearance. The poison acts as a ferment in the part producing matter of the same kind, it passes into the lymphatics, and, when it arrives at the lymphatic glands, causes them to inflame and swell, so that they become what is named a bubo; this affords a considerable obstacle to its further progress, but some portion will always pass forward and be

conveyed into the blood. Here also the same analogy, with some little variation, may be observed; for the effects in both are ulceration of the nose, even of its bones, and at length of the vital parts. Some difference may now be remarked in the effects of those poisons, inasmuch as the venereal virus often attacks the bones of the skull and the leg, but it should be known that the glanderous poison has undergone a meliorating process which the venereal virus has not been permitted to undergo. The glanderous poison is meliorated by grease, by strangles, and by epidemic catarrh. The glanders, though a destructive disorder, has had an antidote provided for it by the Almighty, and, were the animal suffered to live in a state of nature, that provision would be effectual. Whence then arises this difference? The glanders, as has been shown, does not destroy life or materially injure the animal when he is fed well and moderately worked. When thus treated, he does not suffer from it materially; on the contrary, glandered horses, when properly managed, are, in all other respects, in good health, and do moderate work as well as other horses; it is only when he is inhumanly treated, improperly fed, and urged to exertions beyond his power, that the disease produces those destructive consequences which are now too common; for when the vital power

is by such means weakened, even the meliorated poison of *syphilis*, for such it probably is, produces the destructive effects we so often observe. The industry and ingenuity of man was permitted to discover an antidote to the venereal virus, but the Almighty has done it in a more simple manner for the brute. By man this antidote is often rendered imperfect, though not quite ineffectual, for he does not suffer from the virus like man. But if the animal were permitted to undergo the depurating process at grass, which constitutes the antidote; that is, strangles, grease, and epidemic catarrh; and were the original source cut off, the glanders might become extinct. As the cure and prevention of glanders have been pointed out, and the salutary effects, as well as the cure of strangles, catarrh, and grease, have been explained, I shall conclude the subject by observing, that by the term *catarrh*, is meant all those diseases in which there is a discharge from the nostrils, except the glanders; among these there is one I have not yet noticed, which, from its resemblance to strangles, has been named the bastard strangles. In bastard strangles there is a swelling under the jaws, and the disease is often mistaken for glanders; but there is this difference, a corded lymphatic may be observed going from the swelling towards the lips or the nos-

trils; and if these parts are examined it will generally be found that there is a sore or sores on one or both of them which resembles the farcy. And so it really is, for it is produced by the animal's rubbing those parts against a manger on which glanderous matter (or more properly mucus, which is the term I shall in future employ, for it is not *pus*, but *mucus*, that is discharged in glanders), has been deposited, and wounding himself with a splinter. In such cases there is an union of glanders and strangles; the glanderous inoculation taking place at the time that the strangles was beginning to operate. The poisons meet in the gland nearly at the same time. If the morbid fluid of strangles which, like that of glanders, is a mucous fluid, but formed on the tonsils, for they are the primary seat of strangles—if the mucus of strangles precede the glanderous inoculation, the submaxillary glands will be swollen, the swelling gradually increasing and proceeding towards the point when suppuration is to take place; but the glanderous poison, in consequence of its superficial situation being conveyed by a superficial order of lymphatics, quickly arrives at the surface of the gland, and prevails over the action of strangles; the swelling then becomes stationary, and unless some curative means are employed, will remain in an indu-

rated state. Osmer discovered the method of curing this disorder, and, it is to be regretted that he was not aware of the importance of the discovery; if he had, he would have pointed it out in such a manner to the public, as would have led to its general adoption. He was not aware, however, of the nature of the disorder; he considered it, and truly, as an imperfect strangles, but did not know how it was rendered so. He noticed, like Gibson, as I have observed in the former part of this chapter, that the horses he cured of this disorder became so established in their health, that though sickly and weak before, they were healthy and strong during the remainder of their lives. The remedy so successfully employed by Osmer, and that which I now earnestly recommend, is the introduction of a seton through the centre of the swelling. A new process is in this way produced, the swelling proceeds, and a complete suppuration takes place. Thus the depurative process which had commenced, and was interrupted by the glanderous inoculation, is brought to perfection, and completely answers its purpose.

CHAPTER VIII.

STAGGERS.

THE staggers have been usually divided by writers on farriery into two kinds, which they named the sleepy and the mad staggers. They considered the diseases to be of the same nature, differing only in the degree in which they happened. The sleepy staggers they supposed to depend on fulness of the blood-vessels of the brain ; and the mad staggers on inflammation of that organ. They are, however, different diseases, arise from different causes, and must therefore be treated of separately.

CHAPTER IX.

STOMACH STAGGERS, OR INDIGESTION.

IN former editions of this work, as well as in the compendium, I have treated largely of this disorder, considering it to be a subject of great importance ; but in neither have I given what I now consider a satisfactory explanation of the disease. It has almost always proved fatal ; and though many have boasted of being possessed of a remedy, and many cures have been said to have been effected by them, such cures have not taken place in what may be denominated stomach staggers. In examining horses that have died of this disease, the stomach has been generally found loaded with hard dry food ; so large sometimes is the quantity, that it is difficult to conceive how the stomach could have sustained the load without bursting : in one case, the stomach with its contents weighed sixty pounds. The stomach staggers may exist in a great variety of degrees ; the case I have just noticed was one of the worst kind, and of course absolutely incurable ; the same disease, however, though in considerably less degree, occurs much more frequently than the public is

aware of. It is often curable by simple means, and without difficulty, and yet often terminates fatally through ignorance or unskilful treatment. Cattle also suffer from the same disorder, and in a much greater degree than is suspected. As the degree in which the disease happens is various, so are the symptoms diversified, and distinguished by a variety of names; they all originate, however, in the same cause, and that is indigestion. The name staggers has been applied when the disease exists in a sufficient degree to disturb the functions of the brain; but this does not happen until the vital power of the stomach has been impaired to a certain extent, by a continuance, or a frequent repetition of improper feeding; and this morbid state of the stomach is more quickly induced, when, in addition to improper feeding, the animal is worked hard and generally ill-treated. How often do we observe a great number of horses confined great part of a market day in the court or stable of a public-house without food, and not suffered to eat until they return home, probably a distance of many miles, when they are permitted to eat as much bad indigestible hay as their craving appetites may lead them to. Thus is a load of undigestible food taken into the stomach at a time when its vital power has been diminished by fasting; but such is the

power of this important organ, that it will resist for a time even such treatment, and it is only by a repetition of such injuries that at length it is rendered incapable of digesting sufficient food for the repairs of the body. That degree of exhaustion, or diminished power, or rather that morbid condition of the stomach on which staggers depends, is seldom curable. If the animal does recover from the staggers, the morbid state of the stomach is such, that unless he is afterwards fed in the most careful manner, he generally dies suddenly, and it is supposed to be of some other disorder. There is nothing, perhaps, that does so much injury to the stomach as bad hay, except excessive exertion; and when these causes concur, as unfortunately they often do in this country, the most formidable diseases are produced, and almost all of them depend on diminished energy of the stomach. The stomach is a muscular organ, and by excessive exertions of the body may become weakened or injured, in common with all the other muscles; for if the source of muscular power, that is, the brain, be impaired, the stomach will of course participate with the other muscles in the effect. But if we consider the important office of the stomach, that is, the preparation of food in order to form blood, and thereby repair the waste or wear which all the muscles are con-

stantly undergoing, what can be expected when it is supplied with food that contains but little nutriment, and requires its utmost exertions in order to be digested? The excessive exertions in which horses are commonly employed in this country are sufficiently known, and I trust, require only to be reflected upon to be put a stop to. Custom, I fear, has so far familiarized many horse-proprietors to these cruelties, as to prevent them from viewing the situation of the horse as they ought; and we frequently hear them boasting of his excessive, cruelly excessive exertions of the animal, as if the merit of his performance was due to them; and often for the sake of a small bet completely exhausting his vital power. The stomach staggers is not so common as it used to be. I have known farmers absolutely ruined by it, the disease having continued among their horses until all of them have been destroyed. At present they seem to be aware of the error of their treatment, and diseases among this class of horses are far less frequent than they used to be. A concurrence of the causes before noticed, that is, excessive exertion and improper feeding, is most common among post and stage-coach horses; and it is here that diseases of the digestive organs are most frequently met with. Stomach staggers, however, is not the symptom that commonly occurs, it is

one of a different description, that is, the flatulent cholic or gripes. The condition of stomach on which this depends is exhaustion of its vital power, differing from that which produces stomach staggers, not only in degree but also in kind. In stomach staggers, the power of the stomach is so gradually diminished that the disorder almost imperceptibly takes place, and is rarely observed until it is incurable. In the other, the disease is more quickly produced, and therefore the effect is different. I have already observed that stomach staggers is becoming less and less frequent, and I trust will continue to do so; the disorders and ill-treatment of post and stage-coach horses, on the contrary, are daily becoming worse, and imperiously demand the most serious consideration. Horses of this description are more cruelly treated in this country than in any part of the globe, especially in the metropolis and the adjoining towns. The cruelties exercised upon this generous animal are almost constantly offering themselves to our notice, and their continuance can only be attributed to a want of reflection. So materially does the horse contribute to supply the necessities as well as the luxuries of man, that he has a peculiar claim to his protection; and it is deeply to be lamented that an effectual law has not been established to enforce this claim, and support

the rights of this ill-treated animal. If horse-proprietors would but reflect seriously upon the subject, they would be convinced, for it is a plain and obvious fact, that by feeding horses properly, and working them with moderation, they are promoting their own interest in a most essential manner. To return to stomach staggers. As soon as this disease is observed, and it seldom is until it has become incurable, the animal should be bled from the jugular or neck vein, until the brain is relieved, and then the following drench should be given. Compound tincture of aloes, from six to eight ounces. Water one pint. This, if the disease be curable, will excite a moderate action in the stomach, and enable it gradually to discharge its contents, provided they are sufficiently moistened by giving every half hour two drams of the compound spirit of ammonia in a quart of water. When this medicine cannot be obtained, one ounce of common salt may be substituted for it; and if the compound tincture of aloes cannot be had, let two drams of flour of mustard, four ounces of spirit, either brandy, rum, or gin, and one pint of water, be given instead of it. Cathartic medicine, however, is absolutely necessary to carry off the load from the bowels; and for this purpose aloes is the only suitable medicine; and if the compound tincture cannot be procured, half an ounce of powdered

aloes should be given, mixed with a pint of spirit and water. Clysters also are necessary, and should consist of six quarts of warm water and one pound of common salt. This should be carefully injected by means of a long clyster pipe and a large bladder. If the horse recovers, a very small quantity of oats moistened with water should be given several times a day. Hay should not be allowed for some time, or until the tone of the stomach has been in some degree restored, by giving twice a day two or three drams of gentian, in half a pint of beer. When hay is given it must be of the best kind, not exceeding six or eight pounds daily, divided into several portions and dipped in water. Though stomach staggers is seldom cured, it may be seen, from what has been before observed, that the disease might be with certainty prevented; and the same preventive method will be found equally effectual in some other important diseases, that is, moderate work and a sufficient allowance of good oats, with a moderate quantity of good hay; both of them moistened with water.

CHAPTER X.

MAD STAGGERS. PHRENITIS.

IN mad staggers there is generally a high delirium, instead of that sleepy comatose appearance by which the sleepy staggers is distinguished. The animal is often so violent that it is dangerous to approach him, and it is with difficulty that the only remedy can be applied, that is, bleeding until the delirium ceases or the animal falls down. The difficulty of performing the operation, and drawing off a sufficient quantity of blood, renders it necessary, as soon as the two neck veins have been opened, to tie a cord round the neck, in order to keep up the bleeding without standing near the animal. It is unnecessary to save the blood or to measure the quantity, as that can only be determined by the cessation of the symptoms. It has been found necessary to take more than four gallons on such an occasion at one time. If the disease does not submit to this remedy, it may be deemed incurable. Blistering the head has been recommended, and cathartic medicines; the former, however, is not necessary; but if the horse recovers, a dose of physic may be given, and he should be fed very

sparingly for some time; but it is better to turn him to grass, where he should remain for one month at least, and when taken up, fed rather sparingly and in proportion only to his work. Should this disorder return, the same remedy must be resorted to. The disease sometimes causes an effusion of water in the ventricles of the brain, and that is incurable. In this case there is sometimes a remission of the delirium, but it is seldom considerable. Sometimes the delirium changes into sleepiness or insensibility, which denotes the rupture of a blood vessel, generally at the basis of the brain, or the beginning of the spinal marrow: this also is incurable.

Mad staggers is caused by keeping horses idle in the stable and feeding them freely with corn, whereby a greater quantity of blood is generated than is necessary for the repairs of the body; for as the muscles are unemployed there is soon an undue accumulation of blood, and the vital organs are sure to suffer in consequence, especially the brain, the lungs, and the bowels. This disorder most commonly occurs among carriage horses, whose work is little more than moderate exercise, often scarcely amounting to that, while at the same time they are allowed an unlimited quantity of corn in order to keep up what is considered a handsome appearance.

Disorders of the brain occur also among post and stage-coach horses; but they are different from that I have just described. They also require bleeding, and to a considerable extent; but the stomach is the primary seat of the disorder, and it depends upon an exhausted state of this organ, or rather upon an exhaustion of the vital powers of the brain. The nature of their work is such that they require an unlimited allowance of the most nutritious food; and were they fed almost wholly upon oats, given frequently in moderate or small quantities, and moistened with water, they would do their work better, and be much freer from disease than they now are. I have known many horses of this description killed by being worked upon a full stomach.

CHAPTER XI.

INFLAMMATION OF THE BOWELS.

INFLAMMATION of the bowels may be produced in the same manner as mad staggers or pleurisy, that is, simply by repletion of the blood-vessels; but it generally proceeds from other causes, and the most common is indigestion; for the flatulent colic when neglected or improperly treated, or when occurring in such a degree that the small intestines or a portion of them ruptures the mesentery and becomes entangled in it, then inflammation takes place and always proves fatal. There is a method, however, by which such cases may be with safety cured; but by an operation so formidable and dangerous in appearance, that few proprietors, perhaps, will permit it to be performed: I have said, however, that it may be done with safety, and so it will be found. When carminative medicine and clysters fail of relieving an animal in flatulent colic or fret, an incision of about two inches in length should be made in the belly or abdomen, between the projecting part of the hip and the last rib, in a line parallel with the muscular fibres; that is, between a

perpendicular line drawn from the chest to the pubes and a transverse one from hip to hip. At this opening the inflated bowel will present itself covered with the peritoneum, which membrane must be carefully guarded against in making the incision, for unless this be observed, the bowel will not be afterwards easily confined, and then, though the animal will be relieved by the operation, the consequences may be as bad as the disorder it was employed for. The inflated bowel with the peritoneum is to be punctured with a trocar, such as is used for tapping in dropsy. When the instrument is withdrawn through the canula, as it is termed, the latter is to be kept in until all the air is evacuated. The pain will then cease, but unless the cause of the disorder is removed, it is sure to return. That cause is indigestion, and cannot be removed but by avoiding the circumstances which produced it. These circumstances are the same as I have already noticed in several places, that is, improper feeding and immoderate work. These lay the foundation for this and almost all the diseases of the horse. The mischief is not done suddenly but gradually, and often imperceptibly. They are almost universally prevalent, but in various degrees, and perhaps in the greatest degree among post and stage-coach horses. The preceding symptoms of inflam-

mation of the bowels, when caused simply by repletion of the blood-vessels, are similar to those which precede pleurisy; that is, dullness, heaviness of the head, diminution of appetite, and especially redness of the inner surface of the eye-lids. The disease, therefore, comes on gradually, and is sometimes accompanied with quickness of breathing, quick pulse, and other symptoms of pleurisy; as the disorder advances it assumes the appearance of flatulent colic and even of mad staggers. This disease is less frequent by far than that I shall describe in the next chapter; but it does sometimes occur, especially in horses that are changed suddenly from grass to warm stables, and then requires to be treated as I have directed in pleurisy. When the air has been completely evacuated by the operation above described, the skin *only* is to be closed by two or three stitches, and the horse for some time after or during his life should be fed with great care, or the complaint will certainly return, and, after two or three attacks, prove fatal: for this operation cannot be successfully performed more than twice on the same animal. It is scarcely necessary to observe, that inflammation of the bowels, when caused by repletion of the blood-vessels, can only be cured by plentiful bleeding, as I have described in pleurisy. Attention, however, is necessary

to the state of the bowels, for the disorder is sometimes relieved in a certain degree by an effort of nature. It then assumes the appearance of *molten grease*, which is in fact the same thing; that is, an effort of nature to relieve inflammation of the bowels. In this case there will sometimes be a purging, which should rather be encouraged than checked; and if small slimy knobs of dung are voided, especially if they are covered with a substance resembling fat, a pint of castor oil should be given, or the oily laxative prescribed in the second volume. If castor oil cannot be afforded, olive oil will be found the best substitute. Clysters also are useful.

CHAPTER XII.

FLATULENT COLIC, FRET, GRIPES, OR BOTTS.

THESE names are applied in different countries to the disorder noticed in the preceding chapter, as the most frequent cause of inflammation of the bowels, and so it always terminates, if not properly attended to. The disorder comes on suddenly, and is distinguished by the following symptoms. The horse appears very uneasy, looks round to his flank, paws his litter, lifts up his hind foot as if to strike his flank, lies down and endeavours to roll upon his back, sometimes turning himself quite over, or lying on his back. He gets up suddenly, looks round to his flank, but soon gathers up his legs for a short time, and then falls down heavily. If the animal is not relieved, the pain becomes more violent, and he appears almost or quite delirious, so that it is dangerous to stand near him; at length inflammation takes place in the distended bowels, which is soon followed by death. The best remedy for this disorder is the compound tincture of opium, the formula, or receipt for which, may be found in the fourth edition of the second volume. When this is not at hand,

brandy, gin, or rum, mixed with water, is the best remedy that can be employed. The dose, four ounces of brandy or rum, and five of gin, that spirit being generally weaker than the others. Larger doses are often given, but the quantity I have named is sufficient, and should be mixed with a pint of water. Clysters, however, are the most essential remedy, and, if employed quickly and in a proper manner, will render medicine unnecessary; that is, unnecessary as to the removal of the pain. But as the disorder arises from indigestion and exhaustion of the power of the stomach, some cordial is necessary to enable it to recover its tone, and spirit and water, in the quantity and proportion above described, is the best thing that can be employed for the purpose. The air that is generated in consequence of indigestion, is confined in the small intestines, by that valvular structure which is found at that part of the canal where the jejunum terminates in the cæcum, and serves to prevent the return of excrement into the small intestines. As the cæcum, in such cases, is almost always loaded with excrement, this valvular opening is completely plugged up, and it is in this manner that the air is always confined; and not, as it has been supposed, by a spasmodic contraction of the canal itself. The term spasmodic colic, is, therefore, evi-

dently improper. The only effectual method of applying a clyster, is by means of a large pewter pipe fifteen inches in length, including the part to which the bladder is tied. The bore of the tube should be one inch in diameter. The part to which the bladder is fixed should be considerably longer than the other parts, and have circular grooves, that the bladder may be securely fastened to it. This end of the pipe should form a sort of shoulder, so as to close the fundament after the pipe has been introduced. From this part, the pipe should taper a little, and terminate in a smooth bulb. The bladder should be capable of containing two gallons. Warm water, with a handful or two of salt dissolved in it, is as good a clyster as can be employed on this occasion. (The best proportion, is one pound of salt to a gallon of water.) I wish to be clearly understood as to the intention with which the clyster is prescribed; it is intended to remove the fæces by which the air is confined in the small intestines; and if it is not administered carefully, and in the manner I have described, it will fail of the intended effect. The quantity of water to be injected should not be less than six quarts: the syringes commonly employed, are, to say the best of them, useless.

CHAPTER XIII.

ON WEAKNESS OF THE DIGESTIVE ORGANS.

THE introductory chapter to this volume may have led the reader to expect a treatise on the digestive organs only, and so it would have been, had not glanders, farcy, staggers, inflammation of the lungs and bowels, been treated of in former editions of this work: on this account, they have now been introduced. Grease and strangles being diseases that occur in a state of nature, and designed as a preservative against others of a more formidable nature, have also been introduced, and a simple process pointed out, by which they may be made subservient to the purpose for which they were intended. Therefore, I now proceed to a consideration of those diseases of the digestive organs, which have not yet been treated of.

The diseases already considered are of the acute kind, that is, stomach staggers and flatulent colic; those that remain are of the chronic kind, viz. worms, chronic cough, asthma, or broken wind; but the remote cause of all of them is the same, that is, debility, or a morbid condition of the stomach, or digestive organs.

CHAPTER XIV.

ON WORMS.

WORMS are found, not only in the stomach and bowels, but also in the liver, the arteries, and in tumours situated among the muscles. According to Lafosse they are found also in the pancreatic duct; and Lafosse the youngest, in his *Manuel d'hippiatrique*, states that they are found also in the salivary duct. I have met with one case only of worms in an abscess, and that was situated between the external and the large pectoral muscle. The tumour contained an immense number, of various sizes, and a considerable quantity of sanious pus. Within the tumour, or rather on its inner surface, there were what may be considered excrescences, one of them of remarkable size and form. It was three inches in length, one inch and three quarters in circumference at its base, and nearly that at its extremity, and in appearance it resembled a teat. I am of opinion that this excrescence was originally one of the worms, which were of the truncheon kind; that is, such as Markham has described under that name. The worm probably not finding sufficient nourishment in the sanious

purulent fluid of the tumour, attached itself to the inner surface to obtain sufficient sustenance; and being unable to extricate himself, formed a part of the living substance to which it was attached, deriving its nutrient vessels from that part. The worms most commonly found in the stomach are those named botts. These have been described by Mr. Bracey Clarke, in an ingenious paper in the Linnæan Transactions; and in a pamphlet, as the larvæ of a species of gad fly, named *æstrus equinus*, which deposits its eggs in the horse's coat. These eggs, he states, are hatched in the hair; and at that period are licked off by the animal, and taken into the stomach. This name, however (larvæ), is improper, for they are really worms, and ought to be so named; for it may be asked, whence are other worms derived that are found in the bowels and other parts of the body, but from flies? I am of opinion that botts are taken up, in the egg-state, with the grass, at a time when the organs of mastication are incapable of performing their office effectually, that is, during dentition; or when the cheeks are ulcerated and sore from projecting edges on the molares or grinders of the upper jaw, as described in the introductory chapter. Being thus received into the stomach, they gradually acquire size after being hatched, and attach themselves to the in-

sensible or cuticular coat of the stomach. Sometimes, it is true, they are found attached to the villous, or sensible portion of the stomach, and even in such numbers about the pylorus, as nearly to close the opening. Mr. Roberts, a veterinary surgeon of Torrington, Devonshire, formerly an apprentice of mine, found the pylorus completely closed by them, and the animal died in consequence. Botts are always found in the stomachs of young horses about the period of dentition; or such as are incapable of masticating perfectly, as before described. If Mr. Clarke's theory were correct, how is it that botts are found only in the stomachs of horses of the above description? All grass horses have these eggs deposited on their coats; and all others almost that are rode about in summer, especially on commons or fields, though only in small number. Therefore, if Mr. Clarke's opinion were correct, they would be found almost always in grass horses, and often in others, but this is not the case; and it is necessary to notice this mistake, because it has led Mr. Clarke into another of considerable magnitude, which is, that they are seldom, if ever, injurious, and cannot by any means be got rid of. Such respectable authority as Mr. Clarke's, has influenced the opinions and practice of other practitioners, though Mr. Ryding, in his *Veterinary Patho-*

logy, has adopted Valesnieri's opinion, and has asserted that they may be destroyed and expelled by subsulphate of mercury, or turpeth mineral. This, and the opinion of Valesnieri, I believe to be erroneous. The only method of destroying them is that prescribed by Markham; and that is, to keep the horse fasting for ten or twelve hours, then to give him a quart of milk, sweetened with honey, and about five minutes after a dose of salt and water; that is, from four to six ounces of salt, and a quart of water. This leads me to believe that it would be a good practice to give this medicine to horses soon after they are taken from grass, and thereby prevent those dangerous diseases which botts often occasion. The opinion that botts seldom, if ever, do any mischief, is so prevalent, that it is necessary to dwell longer on the subject than it otherwise would have been. The diseases they produce are of the most serious nature. I have known staggers, abscess in the brain, water in the ventricles of the brain, inflammation of the lungs, flatulent colic, and even mesenteric consumption, produced by them. Such is the mischief produced by these worms; therefore I earnestly recommend Markham's remedy being given to every horse, whether from grass or not, in the month of September, for that is the time when they are

most easily destroyed, and when those mischievous effects are produced. The remedy cannot do any harm, and is not expensive. The only observable effect is that of a moderate purgative, for the botts at this period are so small, that they cannot be easily discovered in the excrement; but it is effectual, and should always be employed.

At a certain period of the year, botts, as Mr. Bracey Clarke observes, detach themselves from the stomach, and are carried off with the excrement, in order to become flies. It is commonly supposed that when botts have thus passed out of the stomach, no injury has been done by them. But this is far from being the case; the mischief they do is not readily seen by inspecting the stomach; but they occasion a debility or morbid condition of that organ, and give rise to a series of important disorders.

There is no method of distinguishing when staggers, and the other diseases above named, are produced by botts; and in whatever degree an animal may be bled in those diseases, should they be produced by botts, it cannot afford relief, therefore they should be got rid of before they have done much injury, that is, in September; and the remedy I have recommended should never be omitted. The morbid condition of the stomach induced by botts, requires a further consideration, and will form the subject of a future chapter.

CHAPTER XV.

TRUNCHEONS.

THIS worm has never been described by any author but Markham. He called them truncheons from their form, for when seen in the stomach and small intestines, which are the parts they inhabit or adhere to, they are in a contracted state, and something like that ancient weapon; but of a small size, seldom weighing more than half a dram. They appear something like inspissated mucus when detached from the bowel; but may be drawn out to the length of two or three inches, and then appear flat and thin, with numerous transverse ribs, or rather lines, like a very small ribbon. They adhere, like the bott, to the stomach and small intestines, not in a similar manner, however, but like the leech by their tail end; some apertures are visible, adjoining the part by which they adhere; and this part, especially when the body is drawn out, appears as a bulb or head; but the mouth is at the opposite extremity. They appear from their colour to live upon chyme. From their resemblance to the leech in their mode of attachment, and in their transverse

ribs or lines, when drawn out and empty ; they are probably derived from the water the animal drinks. I once found a worm of this kind in the bowels of a cat, and once in those of a dog.

CHAPTER XVI.

LUMBRICI AND ASCARIDES.

WHY the worms which inhabit the intestines of horses should be thus named, it is difficult to determine, for they do not in one circumstance resemble the earth-worm, except in being viviparous. They are found in the intestines generally, but sometimes in the stomach. They are of various sizes, and have obtained different names on that account; but they appear to me to be all of the same kind, but of different ages, and consequently of different sizes. Those of a small size, from their resemblance to needles, and perhaps from the circumstance too of the irritation they cause about the anus, have been named ascarides; while the largest, which are found chiefly in the small or alimentary intestines, have been named lumbrici and teretes; that is, earth worms and round worms. As worms of that size and form, which are named ascarides, are often found in the mesenteric artery, I am of opinion that the eggs from which they are produced are a fluid, and drank by the animal with his water; that they are then absorbed into the circulation with the chyle, mix

with the blood, and are deposited on the surface of the intestines with mucus. Their size probably depends on the part where they are deposited. So that those in the small or alimentary intestines, finding more chyle than those in the excrementary or large intestines, acquire the largest size; and those nearest the anus are the smallest. The worms I found in an abscess before noticed, were certainly a deposit from the blood; so are fluke worms in the liver of the sheep. Therefore it must be admitted, I think, that the ova are a fluid; and that all the worms found in the stomach and intestines, except the bott and the truncheon, are produced through the medium of the circulation; or, in other words, are deposited from the blood, with the mucus of those parts. When by a continuance of improper feeding, that is, giving such food as is difficult of digestion and deficient in nutriment, the digestive organs are brought into a morbid condition, worms will be generated in the bowels or other parts, on whatever food the animals are fed. From this view of the subject, we are led to the radical cure of worms, which must depend, not merely in expelling them from the stomach and bowels, but by restoring the digestive organs to a healthy condition, to prevent a further accumulation of them. This can only be effected by a proper regulation of diet; that

is, not only in regard to the quality of his food, but also to the quantity, the distribution, the state; likewise, the quantity, distribution, and quality of his water. These are objects of far greater importance than medicine; but medicine as an auxiliary is often necessary. It is necessary, also, that the worms already generated should be expelled from the body; and this is not often easily effected. Cathartics, especially when strengthened by calomel, will do much in this way, but are often found unable to accomplish their complete expulsion. The mucus in which they live is sometimes of that nature, that they cannot be got rid of without the greatest difficulty; and in such cases oil of turpentine has been found the most effectual remedy. There is some danger, however, in the use of oil of turpentine, whether employed for worms or flatulent colic. In the latter complaint, I believe it has done considerable mischief, though it often cures the disorder. In worms, I have known it do much injury in two cases; and in one it caused the horse's death. In these three cases, however, a mild cathartic had been given the day before the turpentine. In the third case, the poisonous effect of the turpentine was observable immediately after it was given. I am inclined to believe that there is often a certain state or condition of the horse's

stomach gradually induced by improper feeding, in which medicines, at other times innocent, will prove poisonous. This morbid condition often exists when worms infest the body; and such, I believe, was the state of the third horse's stomach when the turpentine was given. The stomachs of the other two horses were probably in a morbid state also, but in a less degree. Mr. James Clarke mentions two cases of a horse being immediately destroyed, one by taking a pint of vinegar, the other some innocent drench, in which there was half an ounce of spirit of harts-horn: both innocent medicines in the healthy stomach. The stomach of one of the horses was found much injured by botts; the other, Mr. Clarke was not permitted to examine. Turpentine then, though an efficacious medicine for the expulsion of worms from the bowels, cannot be given without danger, because in all cases of worms there is a probability of the stomach being in an unhealthy state, therefore the following cautions are necessary, should any one be inclined to employ it in future. The plan suggested by the person who first proposed, and as far as I know employed, oil of turpentine for worms in horses, was to give three or four drams of aloes the day before, that they might be in an open state at the time the tur-

pentine was given. It appears, that this gentleman, a surgeon, as well as some farriers to whom he communicated his mode of treatment, were very successful in the treatment of worm cases. From the injurious effects, however, which it produced in the three cases before noticed, and especially in the last, in which a dose of mild physic was given the day before the turpentine, I would advise that the aloes be omitted in future, and the turpentine given in a dose of 4 oz. after making the horse fast four or five hours; and as a further precaution, the turpentine may be mixed with an equal quantity of castor or olive oil.

Since worms are engendered in the body in consequence of an unhealthy state of the digestive organs, gradually induced by improper feeding, the expulsion of the worms is a matter of secondary importance; and the medicines employed for the purpose should be such as are not capable of injuring the stomach. Oil of turpentine, therefore, and strong mercurial cathartics, are unsuitable, and even dangerous remedies. I am inclined to believe the following method will be found both effectual and innocent, provided the horse's diet be afterwards properly regulated, and suitable means employed for restoring the stomach to a healthy condition.

Take of white arsenic, finely levi- } 12 grs.
gated }

Ethiop's mineral 1 oz.

Let them be rubbed together in a mortar until intimately mixed, then divided into twelve doses, one of which is to be given daily in the horse's corn, until the whole has been taken. The morning after the last dose, let the following cathartic be given, unless the bowels are in an open state, and consequently irritable from taking the powder. In that case the cathartic should not be given for two or three days.

Barbadoes aloes 5 or 6 drams.

Ginger 1 dram.

Oil of anniseeds 20 drops.

Castile soap 4 drams.

Syrup enough to form the ball.

The dose of arsenic and Ethiop's mineral may be thought too small; but it will be found sufficient, and what is of the greatest importance, it will accomplish the purpose without injuring the stomach. Both the blood and the chyle will be gradually impregnated with arsenic and mercury: the secretions of the mucous surfaces will be increased and impregnated with mercury, so that the nidus and food of the worms will be rendered poisonous to them in whatever part of the body they may be situated. Botts, however, will resist this remedy, and can only be got rid

of by the means prescribed by Markham. I have one method to suggest for the cure and prevention of worms, which may be of great service when good hay cannot be obtained, that is, giving from two to three ounces of common salt in the course of the day in the horse's food, and continuing its use for some time. The quantity of salt above mentioned may be dissolved in a pail of water, and with this water his hay and corn should be wetted, and he should be allowed to drink the remainder. This may sometimes cause thirst, but he should not be allowed to drink the more water on that account; and if it stimulate the stomach, and increase the appetite, which generally in worms is already too great, and often voracious and depraved, he must be carefully restrained, and be allowed only the quantity I have directed in the chapter on feeding, Vol. I. The bad quality of hay cannot be compensated for by an additional quantity: that would be only increasing the mischief. A small quantity of oat straw is better than bad hay. The deficiency in nutriment must always be made up in oats.

When the appetite is craving, and the horse is often expressing a desire for food by a sort of neighing, or by pawing with his fore feet when his head is tied up to prevent his eating litter; these symptoms of hunger should not be at-

tended to. The allowance of hay I have named should never be exceeded on any occasion whatever. One horse may be supposed to require more food than another by his importunity and the craving of his appetite; but that appetite only indicates a morbid condition of the stomach, brought on by having been too much distended with food. And this morbid state can only be cured by a carefully regulated diet. By such management the stomach will gradually become contracted and vigorous, and the appetite will become moderate. Every grain of food that is then taken into it will be perfectly digested, and applied to the nourishment of the body, instead of serving, as it did before, to load the stomach and intestines, and derange the functions of the whole digestive system, thereby engendering worms and other more serious disorders.

CHAPTER XVII.

A MORBID AND DEPRAVED APPETITE.

IN the healthy state of the stomach, the animal's appetite is such as leads him to eat that only which is fit for the formation of pure blood. This food is grass, for he is certainly by nature a gramenivorous animal. The horse's stomach is remarkably small, and requires to be frequently supplied with food, therefore, in a state of nature, we find him almost constantly feeding. How great then must be the change which the animal suffers when brought into the stable, and what serious evils ought we not to expect, unless this change is gradually brought about, and his diet and exercise carefully attended to? When we consider for a moment in what manner he is generally treated, there cannot be any difficulty in believing, that the stomach must of necessity be brought into a morbid condition. The labour he is employed in is generally excessive; the food he is supplied with is often deficient in nutriment, especially in that kind of nutriment which is natural to his stomach; for even grain is not suitable, because not natural food; and we find that horses which have always been

kept in a state of nature will refuse grain, and require some time and the stimulus of hunger to be brought to it. Good hay will always be preferred by such horses, especially when it has that fragrant smell, greenish colour, and herbage, which it ought always to have. But considering the use to which the horse is applied, grain becomes a necessary diet for him, and if properly dispensed, is the best food that can be given him. Hay, when really good, such as will be described, and given in moderation, is a very suitable diet for the horse, but requires to be assisted with grain, in a quantity proportionate to his work. Some grain should always be given, as without it, the quantity of hay necessary for his support would so distend the stomach, as to induce gradually, by a continuance of such feeding, a morbid or depraved appetite. As it is, the hay generally given to horses, even that which is commonly considered good, is so deficient in nutriment, difficult of digestion, and eaten in such immoderate quantities, that the laborious exertions required in the muscular structure of the stomach to extract what nutritive matter it does contain, is such, as must of necessity bring on a morbid or depraved appetite; and, what is of still greater consequence, if possible, an exhausted state of its sensorial power. Wheat straw, when the

reed has been carefully separated from it, is much better fodder for horses than what is called middling or indifferent hay ; but the daily quantity should never exceed four or five pounds. Grain must be more freely given in this case, of course ; and considering the price of straw, this can well be afforded ; but such a diet is far better than that commonly given to horses in this country. In France, wheat straw is very commonly employed as food for horses, and their manner of distributing the diet of horses, well deserves the imitation of the horse-owners of this country. The daily allowance is given at three times a day, viz. a moderate quantity early in the morning, a smaller quantity at noon, and the largest portion at night. So general is the practice in this country of giving horses an immoderate quantity of hay, of giving bad hay, of distributing the daily allowance injudiciously, both of water and oats, of giving beans unbroken, of working horses while their stomachs are distended with food, by which much mischief is done, and many fatal diseases brought on : so general are those practices, that we meet with but few horses whose stomachs are in a perfectly healthy condition. So numerous are the degrees of morbid condition of the stomach, between the healthy state and that extreme degree of derangement, when

the appetite becomes depraved, inordinate, and even voracious; that it is difficult, if not impossible, to bring each of them under a distinct head. It will be sufficient, for the purpose I have in view, to notice them, as they relate to the organs of respiration; that is, to treat of those diseases of the lungs and its appendages, which arise from a morbid condition of the digestive organs. These diseases are commonly known by the names chronic cough, roaring, and broken wind. To accomplish this in a manner sufficiently clear and intelligible, it is necessary to give a concise description of the organs of respiration, and those of digestion.

The mouth, the tongue, the throat, and the passages to the stomach and lungs, are covered with cuticle, but of various degrees of thickness; so that the sensibility of the different parts is nicely adapted to the purpose for which they are designed. These purposes are, gathering the food, masticating it, moistening it with saliva, and swallowing it. The first is effected by the front teeth, the second by the grinders; the saliva is separated from the blood by three pair of glands, named, parotid, sublingual, and submaxillary. The latter have always been described as lymphatic glands; but there is no difficulty in demonstrating that they secrete saliva and their excretory ducts may be seen near the

tonsils. The parotid glands pour out their saliva through an opening between the second and third grinder on each side, and the sublingual by two small tubular papillæ under the tongue, and it is by the motions of this organ that the saliva is diffused over the parts where it is required. The saliva is necessary, not only to facilitate mastication and swallowing, but serves likewise a very important purpose in the stomach, being necessary to digestion. The masticated food is placed by the motions of the tongue into the upper part of the gullet or œsophagus, which is named pharynx. The pharynx is large, and capable of considerable dilatation, but soon contracts into a small but strong muscular tube, named œsophagus. The part where the œsophagus begins is so contracted, as to have the appearance of a stricture; and it is here that the strong cuticular, or, as it is commonly named, insensible coat of the stomach begins. When the food gets into the pharynx, it is swallowed into the œsophagus, and from thence into the stomach, by the muscular contraction of those parts. There is a glandular cavity on each side of the throat, named tonsil, which secretes a mucous fluid, which is retained in the cavity until wanted by a semicartilaginous flap; this has been described as the opening of the eustachian tube; but this opening is

situated immediately above it. The mucous fluid is forced out by the action of gaping at those times when it is wanted. The tonsil is the part affected in strangles, and the matter formed in this glandular cavity passes down through the excretory duct of the submaxillary gland, inflames it, and causes it to become an abscess. This abscess is commonly, but erroneously supposed to be the seat of strangles. The horse's stomach has nearly one half of its surface lined with that strong cuticular membrane which lines the œsophagus. It terminates abruptly, and by a fringe-like edge. It is on this part that botts are usually found; sometimes, however, they go from this part and attach themselves to the sensible part of the stomach, properly so named; for it is endued with exquisite sensibility, and is one of the most important organs of the body; its office being that of digesting food, and so preparing it as to render it fit for forming blood. Much has been said of the gastric juice, as if some peculiar fluid were formed in the stomach for the purpose of digestion, and physiologists and chemists have been at considerable pains in investigating the composition and nature of this fluid; but their researches have always proved fruitless, and ever will, for the juice they have examined is nothing more than a common mu-

cous fluid, such as is found in the intestines and other cavities. In the horse, digestion and chylification are performed in the stomach only, not by any particular juice that is formed there, but by virtue of its sensorial power, which it derives in common with all the vital organs, but in a more especial manner, from the cerebrum or brain, and from that part of the brain named corpora pyramidalia, through the eighth pair of nerves, or par vagum, as they are termed. It appeared necessary to go thus far into a description of the digestive organs, that is, the organs subservient to digestion, in order to impress upon the reader's mind the importance of the stomach in the animal economy, and to show him how liable it must be to become diseased when frequently distended with unwholesome food, which, containing but little nutriment, requires its utmost exertions in order to be digested; and such is the hay often given to horses. In describing the organs of respiration, it is necessary to begin with the nostrils, which are kept open by two muscles: it is necessary to bear this in remembrance, for if these muscles, or their tendons, are wounded, and thereby divided; or if they are so weakened by twitching or otherwise, as to become a paralytic, the flap or wing of the nostril, as it is termed, will fall down, and breathing will be obstructed;

if both muscles or tendons happen to be divided, the obstruction will be such as to suffocate the animal. Near the extremity of the nostril at the under and inner part, a small orifice is observable, which has been mistaken for a glanderous ulcer. It is the termination of the lachrymal duct by which superfluous tears are conveyed from the eye. All the interior parts of the nostril are lined with a vascular and highly sensible membrane, which has a very extensive surface formed for it by means of four extremely thin and delicate bones, which, from being coiled up like the folds of a turban, are named turbinated bones. Over this membrane the olfactory nerves ramify in innumerable branches, receive the impressions of odorous bodies, and transmit them to the organ of smell, which in the horse are improperly named olfactory nerves, for they are really ventricles, and serve a very important purpose. The use of the ventricles of the brain have never, as far as I know, been satisfactorily explained. These cavities contain a compressible vapour, which enables the brain to accommodate itself to the influx of blood during respiration; hence it is that when a portion of the skull has been removed, we observe the brain rising during inspiration, and falling during expiration, which motion has been erroneously attributed to a pul-

sation of the arteries. In the horse then we shall see how essentially necessary those additional cavities or ventricles must be, in enabling the brain to bear the rapid succession of the influxes of blood during violent exertion. These cavities form the organ of smell; that is, they are the part where odorous impressions are collected, and retained, for the intellect to judge of them. The other prominent parts within the two lateral and the third ventricle, are also the residence of the senses and the intellect, though never discovered by those indefatigable anatomists Gall and Spurzheim. The thalami nervorum opticorum are the organs of sight. The corpora striata, are the seat or rather the sensorium of vitality. The corpora olivaria are the organs of taste. The corpora tri-gemini, the organ of hearing, and the nates and testes, the organ of intellect. The cerebellum is the seat of muscular power. The iter ad tertiam ventriculum, or passage to the third ventricle, has a use that is not known or even suspected. It forms a communication between the organ of sense and the organ of muscular motion. The pituitary gland secretes the vapour which I have before described. The two branches from which the spinal marrow appears to originate, is the sentient organ, or organ of feeling. The spinal marrow, though generally considered as a single

cord, consists of two spinal marrows, having a cavity between them through which the muscular power is transmitted. This may be distinctly seen in animals that have died of violent exertions, or that have been destroyed in any violent manner whatever; that is, when death is preceded by violent muscular exertion. The muscular power thus transmitted is the principle of attraction, and that to which the muscles owe their prodigious strength. This principle, however, to be called into action, requires the assistance of the vital power, which it receives also from the spinal nerve, through the communication it has with the great sympathetic nerve, the *par vagum* and *corpora striata*. I have seen this power so completely exhausted by violent exertion, that the muscles were exactly similar to what they would have been, had they been macerated several days in warm water. Thus we find that the muscles have a contractile power, and a vital power; the former derived from the cerebellum through the spinal nerves, and the latter through the great sympathetic nerve.

Having been led into a brief but novel description of the brain from that of the olfactory nerves, as they are erroneously called, I thought it right to extend the description to the spinal marrow, in order that the reader may compre-

hend what I shall have to observe when speaking of the nerve operation ; for the arteries will be considered under two views, as contractile and secreting tubes, and as vital and sentient tubes ; the former power continuing after the latter has been cut off, through the communication formed between them by the great sympathetic nerve. To return to the organs of respiration. The upper part of the nostril is of a peculiar structure in the horse, being remarkably large, and so inclined towards the opening of the windpipe, especially when the animal is galloping, as to facilitate respiration in an essential degree. In violent exertion, when it is absolutely necessary, respiration is carried on through the mouth also, which is then opened in such a manner, that the velum pendulum palati ceases to act as a valve : a similar effect is produced in coughing. This valve, formed by the velum pendulum palati and epiglottis, is of essential use ; for as the animal in a state of nature is constantly feeding, it was necessary he should have a power of doing this, without any interruption being made by it to respiration. Having accumulated a sufficient quantity of masticated food (for he gathers and masticates at the same time), to form a morsel, he raises his head and swallows it quickly, for as the food passes into the pharynx the epiglottis is forced

down, and closes the opening of the windpipe so completely, that not a particle of the food can fall into it. But in feeding on dry light oats, bran, malt dust, dry chaff, or such food, a very small part is liable to get into the larynx: such accidents are of a serious nature, and sometimes occur. Such food therefore should always be made wet with water. The upper part of the windpipe, named larynx, is of very curious structure, of exquisite sensibility, and capable of shutting itself so completely, as to exclude even air. This is seen when the animal is confined in air unfit for respiration, especially in carbonic acid gas, for that is the excrement of the lungs. Though the larynx is thus exquisitely sensible, yet the same membrane, when continued into the trachea, appears to be destitute of feeling, and this seems to be effected by a very simple contrivance. In the larynx this membrane is so extremely thin, and so tense or stretched, that the slightest impressions are felt by the laryngeal nerves, most especially at that part where the very highest degree of sensibility is required; that is, at the rima or chink of the glottis. From this part the membrane as it descends becomes thicker and looser, and is thrown off at the posterior part from the cartilages of the trachea by the intervention of cellular membrane, in which are numerous vessels

whose office have never I believe been described. Their use, however, may be clearly demonstrated by injecting the thyroid artery, as it is called, with ink. It will then appear that the gland hitherto named thyroid, because its office was unknown, is really a mucous gland, whose excretory ducts pass in innumerable branches over the chink of the glottis, and pass down under the laryngeal membrane into the cellular membrane before described. There they may be distinctly seen, when injected, as I have described, with ink, through the thyroid artery. The use of this gland then is to form a delicate mucous fluid for the lubrication of the larynx in particular, and afterwards of the trachea and bronchial vessels, for they pass down in the cellular membrane, which unites the cuticular membrane with the cartilages, and by the various motions produced in those cartilages the mucous fluid is forced out. The lungs are composed entirely of the ramifications of the windpipe, not terminating, as is commonly supposed, in cells, but at the surface, immediately under the pleura; their open extremities being closed by that delicate membrane only. This may be demonstrated by removing a small portion of the pleura, and then forcing air or ink into the trachea. This description is necessary to enable the reader to understand the nature of broken

wind, and must therefore be kept in remembrance. In speaking of the thyroid gland, I observed that it was so named from its use being unknown; but it is rather from its supposed resemblance to a shield, and it is the same with another gland, the use of which is unknown, and is therefore named *thymus*, a greek word signifying thyme. This gland is situated within the folds of the mediastinum, in the cavity of the thorax or chest. Its office is that of secreting a fluid, the use of which is more important than can well be imagined. In appearance it resembles the pancreatic juice, and is, in fact, precisely of the same nature. It is the coagulating principle, and serves the important purpose of converting the blood into fibrine, and from that, assisted by the vital power, into muscular fibre, and all other parts of the body. Notwithstanding the importance of this gland, it is always destroyed at the earliest period of infancy by improper feeding. The excretory duct of this gland opens obliquely, like the pancreatic duct into the intestine, in the curvature of the stomach, between the entrance of the œsophagus and the pylorus. The pancreatic juice serves a similar purpose, and is not lost at so early a period, especially in the horse and other animals, whose labour is necessary to man. But in cattle, and animals designed for

the slaughter-house, whose fat is more useful to a certain extent than muscle, the orifice of the pancreatic duct becomes closed at an early period, or as soon as the animal has attained sufficient bulk. The duct then forms a communication with the hepatic duct, or, as it is named in human anatomy, ductus choledocus communis, and the pancreatic juice passes off with the bile as an excrement.

CHAPTER XVIII.

OF CHRONIC COUGH.

By distending the stomach with food, especially such as is difficult of digestion, various morbid effects are produced. First, it impedes the action of the abdominal muscles, the diaphragm, and all the muscles of respiration, thereby causing what is termed difficulty of breathing. The difficulty in inspiration prevents the ready return of blood from the brain, and consequently more is determined by the carotids to the laryngeal glands. The difficulty in expiration prevents a proper degree of excretion from the lungs, and consequently an accumulation of carbon in the blood. These two effects concur in producing a third, and that is, an increased secretion of mucus by the laryngeal glands. This mucous fluid is designed to lubricate the larynx, and protect it from irritating matter, and is occasionally, or when wanted, forced through the cuticular membrane which lines the trachea and its innumerable branches: for in inspiration the cuticular membrane is stretched or elongated downwards, and thereby applied more closely to the cartilages.

In expiration, the mucous fluid is squeezed out of the substance of the lungs. But when breathing is rendered difficult by distension of the stomach, as before observed, the mucous fluid is rendered unfit for the purpose for which it was designed, and instead of protecting the larynx from irritating matter becomes itself a cause of irritation. Hence then the cough which is termed chronic; which is always worse when the stomach is distended, and better when the stomach is empty.

The remedy for this disorder is sufficiently obvious, the means of prevention are not less so, it is therefore unnecessary to say more on the subject, unless it be that, if this imprudent manner of feeding horses is still persisted in, diuretics may be given for the purpose of carrying off that irritating mucus by the kidneys, which must otherwise be thrown off upon the larynx and lungs. These, however, when frequently given, will in the course of time derange the functions of the kidneys as well as the bladder, then render them torpid, and at length destroy them altogether. Here then we observe another example, among those that are continually offering themselves to our notice, of the wisdom and goodness of the Almighty, in preserving one kidney on such occasions; for on examining dead horses that have been treated a consi-

derable time in this manner, we find one kidney only so far diseased as to become useless. No other medicine is necessary, except that the state of the bowels should be attended to. The reader is now furnished with such a knowledge of this disorder as will always enable him to prevent it, and if taken in time to cure it.

CHAPTER XIX.

ROARING.

THIS disorder is produced by the same causes as the preceding, but in this the mucous fluid is in such a morbid state as to obstruct the vessels, or rupture them, and thereby produce a thickening of the membrane covering the chink of the glottis, by which the edges are made so nearly to approximate, that the air in respiration causes that sound which is termed roaring. This disease is never removable: but is either palliated or aggravated, according to the manner in which the horse is fed. Wholesome food should be given in small portions at a time, and made wet with water—water in small quantities at a time, and in moderate quantity altogether. This disorder, as well as broken wind, is liable to terminate in what is termed anasarca of the lungs: that is, an effusion of water in the cellular membrane, between the cuticular lining and cartilages of the trachea, and its branches. At the upper and posterior part of the trachea this cellular membrane is large and very observable; and it is here where the branches of the excretory duct of the laryngeal gland are so easily

demonstrable, by injecting what is named the thyroid artery with ink. They are then distinctly seen passing down in numerous branches through this cellular membrane, accompanied by numerous branches of the recurrent nerve as it properly is termed, for in quadrupeds the par vagum, or eighth pair of nerves, after passing into the chest, and giving off an important branch to the heart, by which both it and all the arteries are supplied with their sensorial or vital power. It then returns upon itself almost, passes up in the same course, and supplies the laryngeal gland, the larynx, and its muscles, and is lost in the cellular membrane above described, among the numerous branches of the excretory duct of the laryngeal gland. This cellular membrane is then continued on, at first chiefly in the posterior part of the trachea, then it accompanies the innumerable branches of the windpipe to their very extreme points, which are covered only by the pleura. The pleura is a very thin transparent membrane, possessed of some strength, and considerable elasticity; it covers all the surface of the lungs, and that consists of the open extremities of the innumerable branches of the windpipe.

This description is necessary to enable the reader to comprehend the nature of broken wind; which has been stated by Mr. Coleman to depend on a rupture of the air cells of the

lungs. Others, as well as myself, have denied this statement, and have been led to suppose that a preparation employed for demonstrating this was an artificial preparation. Mr. Coleman's statement, however, was correct in some measure; for the air vessels, not cells, are sometimes broken, but probably not often, for they are possessed of considerable strength and elasticity. In violent inspiration, therefore, they are extended even to their extremities, then by a violent compression those extremities force off the pleura; and when this is detached, the pleura is forced up in the form of a transparent bladder. The next step is, that this bladder is burst, and the air is thrown out into the cavity of the chest. Now begins that peculiar kind of breathing by which broken wind is distinguished, that is, by breathing, as the French express it, in double time. This is caused by the long continuance of the expiration, for the muscles of the abdomen are employed to force back the air which has been thus extravasated, and being fatigued by their long continued exertion, drop suddenly, but are not wholly relaxed, for after a short interval they are forced down further, by the descent of the diaphragm. Such is the nature of broken wind, which is the last degree of disordered respiration, and will form the subject of the next chapter.

CHAPTER XX.

BROKEN WIND.

HAVING in the former chapter explained the nature and cause of broken wind, there remains for me only to make now some general remarks on the disorder, whereby the only means of preventing and palliating it may be learnt. Broken wind is a disease depending wholly upon improper feeding, by which is meant giving unwholesome food, or an improper quantity even of good food, especially hay, which is generally so badly made, as to be very seldom what may truly be called good. Frequent and especially habitual distension of the stomach weakens that important organ in an essential manner, diminishes its sensorial power, and thereby renders it incapable of a due performance of its functions; hence impure chyle, blood abounding with saline matter, mucus, and water; the large intestines loaded with excrement, whereby the mesenteric veins are prevented from discharging their excrementitious contents. The liver, in consequence, receives more blood than it can dispose of, that is, than it can depurate or take bile from; thus the mesenteric veins become

loaded with blood, and in consequence it becomes stagnant in the mesenteric arteries. The trunks of these vessels become diseased and thickened, and worms similar to ascarides are deposited in them; this disease increasing, the artery sometimes acquires an enormous bulk. I have seen the large mesenteric artery as large as an infant's head, and some of its branches were in a similar state, but of a smaller size. The posterior mesenteric artery is sometimes in the same state, but often escapes, for the veins of this artery return blood from the rectum only, where the excrement, though hard, will, by its globular form, leave spaces where the fecal blood may freely be deposited, and is often seen in the dark red coloured shining matter with which the dung is covered. The mischief does not stop here, for the impure chyle, by its acrimony, causes an obstruction in the lacteal vessels, especially at those parts where they converge together, coalesce, and form what are named, mesenteric glands. In some of these the vessels are ruptured, the part swollen, and the central part, or nearly the whole obliterated; a few of the superficial vessels being left which are seen passing over the gland. Thus far have I traced the effects of a distended stomach, and of a consequent disordered digestion, especially when that distension has been caused by bad hay.

The effects, however, upon the organs of respiration, are of more serious importance. The difficulty in breathing thereby produced, causes a deficient oxygenation of the blood, as well as of that depuration it is designed to undergo in passing through the lungs. The carbon that should have been discharged in this process, is thrown back upon the circulation, and thus the mischief is increased. If we next consider the effect produced upon the brain, we shall find it to be of the greatest importance. The vital principle or sensorial power is secreted from the blood by the brain, that vital principle is oxygen, and that being deficient, the whole system is weakened, and all its functions are discharged in an imperfect manner. Having now finished the description I intended to give of the diseases of the organs of respiration, arising from a disordered stomach, I proceed to a consideration of those of the brain arising from the same source, the principal of which is hydrocephalus or dropsy of the brain. This disorder, however, though sometimes occasioned simply by a morbid state of the stomach, is often brought on by the irritation of botts. Botts, however, even in the healthy stomach, will sometimes produce hydrocephalus, locked jaw, and other formidable diseases. The state of stomach on which hydrocephalus depends, is of a temporary nature, and it is by a

frequent renewal of it that the disorder is produced. What then, it may be asked, is this state of the stomach? it is simply distension, with any food, but especially with hay, and more particularly when that hay is bad. The difficulty of breathing, which a distended stomach occasions, though not so considerable as to attract particular notice, is sufficient to prevent a free return of blood from the head, and consequently a more copious formation of that compressible vapour before described, with which the ventricles are filled. The vessels through which this vapour passes are gradually enlarged, and the vapour, in consequence, gradually assumes a denser form, and at length becomes a fluid. Supposing a continuance of the cause, there will be a gradual increase of the fluid, and the effects produced will vary according to circumstances. If the fluid accumulates quickly, the disturbance produced in the functions of the brain, will be such as to occasion sluggishness in labour, dullness of sight, starting, pain in the head, and a nervous starting at sudden noises. The organs of hearing may also be affected, but deafness, I believe, is a very rare occurrence in the horse. I have met with only one case, and in that the horse could not hear the firing of the cannon in Dover Castle. They are sometimes supposed to be deaf, when they

are really not so. The horse is possessed of intellect, and has often sagacity enough to know how to deceive his master. I have known a horse do this, and continue to be considered as a deaf horse, which completely answered his purpose, for he found at last that he could go on at his own pace; but when he heard another horse attempting to pass him, the spirit of emulation prevailed, and he went on freely without whip, as fast or faster than the owner desired. Sometimes the fluid accumulates so quickly as to fill the ventricle in a short time; at others it proceeds gradually, or remains nearly stationary, producing no other effects than those already described. But when it accumulates in such a degree as to disturb in an essential manner, the functions of the vital organs, a means has been bountifully provided to remove the distension for a time, by opening a passage to a cavity adjoining it, but on the *same side*. This passage, it should be observed, is not open in the healthy state of the brain; its sides are then in contact, but, at length, the fluid accumulates in sufficient quantity to open a passage into the other cavity, and this produces a temporary alleviation of the symptoms. This cavity being filled by a continued accumulation of fluid, a passage is opened into a third cavity, and that is the sheath of the spinal marrow. These three ca-

vities being filled, the *septum lucidum* is at length forced open, and the water is admitted into the second ventricle of the brain, from whence it passes in succession into the other two cavities on that side also. These being filled, the animal is destroyed. There is another kind of dropsy of the brain, which is caused by an animal named an hydatid, being formed in it. This disorder is hereditary, and very common in sheep, but seldom occurs to horses. Horses are designed by the Almighty for the service of man : he is, therefore, endued with extraordinary muscular powers, and great constitutional strength. Sheep are designed also for his use, but only as food and clothing ; and here also we may observe the goodness of the Almighty, for the disease scarcely ever destroys him until the fleece has become perfect, and he has acquired his full size. Hydrocephalus is an incurable disorder, except in sheep, and in those animals it may be cured, by puncturing that part of the skull where the bone will be found wanting ; a small spot in the skull being always absorbed at a certain period, by the pressure of the hydatid upward. This period may always be known by the state of the animal's sight, for he becomes blind in the opposite eye, and deaf, I have reason to believe, in the opposite ear. He turns round also when

moved on the blind side, and is, therefore, supposed to be giddy, and the disorder is named giddiness. When these symptoms are observed, the soft part of the skull should be punctured with a cobbler's awl; nothing more is necessary. This circumstance has led me to reflect on a case I once read in a medical journal, in which it was stated, that a hydrocephalus child was cured by a similar operation. Is it possible that the hydrocephalus of children may sometimes depend on the same cause? It should not escape notice, that the water accumulates on one side of the brain and spinal marrow, and that it is only when these three cavities are completely filled that it forces its way through the *septum lucidum*, and fills the cavities on the other side in succession. It is also worthy of remark, for I have reason to believe that it is so, that the cavities on the right side are always first affected, and this for the reason, that the organs of sense, as well as of motion on the *left* side, are thereby rendered paralytic. Epilepsy, or falling sickness, and vertigo, or megrims, are likewise effects of water in the cavities of the brain. I have known one case, however, where a horse fell down and remained for a short time insensible, merely from a distended stomach and bowels: this horse was turned to grass, and recovered permanently. The last effect I shall

mention of compression of the brain, in consequence of a distended stomach, is that which is produced upon the muscles of locomotion; and this is such, as not only to cause stumbling, but even falling, so as to endanger the rider's life; and sometimes the effect is such, as to render the animal incapable even of moderate work. Distension of the stomach will not merely occasion stumbling and falling; I have known horses in a coach fall down and die from this cause during their work.

I cannot conclude this important subject, without once more repeating, that in all those diseases arising from a morbid condition or distension of the stomach, though the cure is difficult, and sometimes impossible, prevention is easy and not expensive. It requires only more care in the choice and distribution of food, and more moderation and humanity in working the animal. By attending to this, the horse-proprietor will be amply repaid, not only as it regards the saving he will experience in the continuance of the life, and health, and consequently the labour of the horse; but also as it regards his own feelings as a Christian.

The muscular debility arising from a distended stomach is considerable; but what is it when compared to that which is produced by the immoderate and cruel exertions, in which those

poor animals are often employed, especially in stage coaches, where their work is daily and unremitting. In the hottest day in summer they are compelled to do the same work, and to travel at the same rate, as in the coldest day of winter; and such is the generous and emulative spirit of the horse, that he will endeavour to perform the painful task, though he drop down and die in the attempt. Considerations of this kind lead me almost insensibly into another part of my subject, that is, lameness, which almost always arises from the immoderate, cruel, and foolish manner in which this useful animal is worked. Foolish it is, most certainly, because it is wicked; but it is likewise directly adverse to the proprietor's interest in every respect, to do so.

CHAPTER XXI.

ON LAMENESS.

IN the first edition of this volume, I gave the substance of some lectures I delivered at Exeter, on the structure, economy, and diseases of the horse's limbs, with a view to the prevention and cure of lameness. This attempt has been so favourably received, as to pass through four editions in a few years. I am now, for the fifth time, entering upon a consideration of this important subject, which I can assure the reader has received my most serious attention, and will continue to do so as long as I am able to attend usefully to the veterinary profession. That prevention is easier, and far better than cure, is an old but valuable proverb, and in no case whatever is it more applicable than to the subject of the present chapter. I have, therefore, chosen it as a motto to the volume, and shall do so with every other volume I may in future publish. Lameness is produced by a variety of causes, so numerous, and often so obscure, that to discover the seat of lameness with accuracy and promptitude, is a mark of professional acumen, to which every young prac-

tioner should aspire. Let him not, however, be led by this consideration to give a hasty opinion in cases of lameness; but on the contrary, let him investigate carefully, deliberately reflect upon all the circumstances of the case, and be well assured that he knows the seat and nature of the lameness before he gives an opinion. Lameness may exist in a great variety of degrees; the shades, for so they may be named, between soundness and positive lameness, are so numerous, that to give a name to each would be impossible, and if possible, unprofitable. It will be sufficient to describe lameness under the names commonly employed, and such as I have adopted in former editions of this work. Some additions and alterations will be met with, and those I trust of a very important nature. From the preceding part of the volume, the reader may form some judgment of the nature and extent of those alterations and additions. The serious loss and inconvenience arising from lameness, have excited particular attention to the subject; and though considerable improvement has been made within a few years in the art of shoeing, as well as in the treatment of lameness, it is a generally acknowledged fact, I believe, that a large proportion of the lamenesses that occur will only admit of palliation and that a considerable

number are absolutely incurable, especially those in the feet. It is much to be regretted, that the severe operation named firing, should have been made so profitable as it has been, for many horses are fired when there is not the slightest chance of doing good. That dreadfully cruel operation, drawing, or rather tearing off the sole, has been completely discontinued, and I trust, I may indulge a hope, that firing for the future will not be performed, merely for the sake of profit.

In alluding to the improvements in shoeing, I do not mean to include that which has been introduced from France, except as it regards the nailing of those shoes: for as to the French shoe, and its boasted *giasture*, I think it the most absurd imaginable. That lameness is much more frequent in this country than in France, is a fact that must be admitted, and ought to be deeply lamented, because it is an evil that may and ought to be prevented. On what, then, it may be asked, does this particular frequency of lameness in this country depend? The French say on shoeing, but it is not really so: on the contrary, I am of opinion that the English shoeing, speaking generally, is the best in the world. The frequency of lameness, so loudly and justly complained of, arises wholly from the immoderate and cruel manner in

which the animal is worked. Though the prevention of lameness is considered as an object of the highest importance, a plain description will also be given of those diseases, by which it is caused, and the mode of treatment will be minutely detailed. It is not, nor has it ever been, my intention to address professional men only; my book is intended for general use, therefore, in this part, especially, all technical language will be, as far as it is consistent with the subject, avoided, and the diseases will be explained as plainly and clearly as I am able.

On Muscular Lameness.

Lameness may depend on different diseased states of the muscles, and these must be considered under distinct heads. Muscular lameness may arise from over exertion, whereby an acute degree of inflammation is sometimes brought on, and a consequent exhaustion of their sensorial power. Different degrees of the same affection may be produced, the lowest of which, is that of excessive fatigue, which is expressed by the animal while at rest, in lying stretched-out on his side, the head reposing at the same time, and generally, if not always, at the full length of his halter. When the fatigue is considerable,

he often groans and stretches himself out suddenly, and from the same cause we often see horses, when standing, after getting up from this situation, first stretching out one hind leg, then the other, then drawing up the body and yawning; all these appearances are indicative of great fatigue, and should always be attended to. Horses, when only moderately tired, never lie down in this manner, but repose, as a cow does when ruminating. Old horses are sometimes so stiff, and so debilitated in their muscular system, that they are unable to lie down; and if they do happen to succeed in an attempt to lie down, they are incapable of getting up again without assistance; and when this is not at hand, they often injure themselves materially, or exhaust their strength by struggling.

Lying down on the side, at full length, is by no means an easy position for the horse; he cannot lie so long without feeling great pain. For such is the weight of his body, as well as the distribution of the muscles, that the only easy position in reposing, is that of the ruminating cow. Horses that have become thus stiff, and weak in their muscles, would be greatly relieved by a support of the breeching kind; and this, I must observe, is a much better method, in every respect for supporting a lame horse, than that which is named slinging, and

may be contrived with very little trouble. The next degree of muscular affection to this, is commonly named a chill; which does not depend, as is commonly supposed, on suppressed perspiration, but on a certain degree of exhaustion of the sensorial power of the muscles. The manner in which this sometimes appears to be produced, is the cause of its having been thus named; for it often happens, when a horse has been violently exercised, that he is suffered to stand in a current of air to cool, or left there through negligence or drunkenness, and sometimes until he is scarcely able to move. But a more common method, and unfortunately one too often authorized by the inn-keeper or coach-master, for their's are the horses most commonly so treated, is that of plunging them into the pond; and not satisfied with a short immersion, they are generally kept there for the purpose of washing the carriage also. The apology for this practice is, that the horses are thereby refreshed, but the inducement really is, I believe, that it saves trouble. The injury this does, is not always immediate, nor is it always perceptible; but one thing post-masters may rest assured of, it always occasions some degree of muscular debility. It must not be supposed, however, that immersion in cold water will alone do this mischief; on the contrary, in summer, when they have no work, but are merely

exercised, they are greatly refreshed and benefited by it; the mischief arises in consequence of previous exhaustion by excessive exertion, and so great may be the mischief, that the horse may drop down dead from a complete exhaustion of muscular power. This is a fact known to experienced sportsmen, and ought to be guarded against by those of less experience. A CHILL then, or the second degree of morbid affection of the muscular system, depends on an exhaustion, in a greater or less degree, and more or less general, of the sensorial power of the muscular system. The symptoms thus produced are great stiffness of the body, so that the horse is nearly incapable of moving himself; sometimes the hind parts are more affected than the fore parts, and often both are so affected, that the horse is absolutely incapable of moving, so that he drops down and dies exhausted. Sometimes there is what is called a re-action of the system, that is, by what is generally considered a violent effort of nature; the blood is thrown towards the surface and the extremities, and a violent perspiration and inflammation of the feet are the consequence. This effect is generally as bad as the original disorder, that is, as it regards the horse, whose feet are of such essential importance, that unless they can be restored again, he is thereby rendered useless. It is of importance, therefore, to employ

the remedy which will soon be pointed out, and to its full extent, and thereby prevent that destructive effect which has been improperly called an effort of nature. The effect thus produced on the feet is sometimes so great, that the hoofs are thrown off by the violence of the inflammation, and in a few instances, I have known even the feet themselves slough off or separate as high up as the fetlock joint.

The third degree of muscular affection generally destroys the horse in the course of a few hours. Such cases happen only, I believe, during a severe chace, and can only be relieved by bleeding to the extent of *two gallons at least*. If the horse faints from the bleeding, it may be considered a favourable circumstance; and if he does not faint, perhaps it will be advisable to take a larger quantity of blood. The same remedy is applicable to the second degree of muscular exhaustion, and equally necessary. But as to the first degree, or excessive fatigue, rest is the only remedy required. Cordials of all kinds may be considered poisonous. Purgatives are extremely dangerous, but clysters are always useful, when properly administered, or so as to empty the large intestines. See vol. ii. article CLYSTERS. No other medical treatment is required, except when the muscles of the loins and urinary organs are affected, and then

a fresh sheep-skin should be placed on the back and loins, with the flesh side next the skin; this will soon excite a copious perspiration on the part, and thereby afford some relief. But the warm clothing commonly employed and warm stables, are extremely prejudicial. Such horses cannot be kept too cold. The sheep-skin does good by the peculiar effect it has in exciting a speedy and copious perspiration, and should always be renewed when the first acquires an offensive smell. This remedy, I must observe, is one of great importance, especially in locked-jaw. Its use in this complaint was first pointed out in a treatise written on the subject by Mr. Wilkinson, Veterinary Surgeon, of Newcastle. The urinary organs are very commonly affected in over-exertion of the muscular system. This appears sometimes in a frequent desire to make water, attended with much pain and difficulty. The attempt to stale becomes almost incessant, and a few drops only are voided of a high colour, approaching to that of blood. The pain becomes dreadful, so much so, that the horse appears griped, and if not prevented by the stiffness of his muscles and the lameness, he lies down, groans, and endeavours to roll, he then gets up again, and renews his painful but ineffectual efforts to stale. These symptoms indicate a violent inflammation of the kidneys, and

not of the bladder, as it is commonly supposed to do. The sheep-skin in this case is an essential remedy, and must never be omitted. The bladder, however, is sometimes affected as a muscular organ, independent of the kidney. The symptoms, then, are different. The muscles of the loins appear to be especially affected, and the horse appears as if he was chinked, as it is termed, that is, as if his back were broken, and some pressure was thereby made on the spinal marrow. The horse often drops down behind suddenly, and when he gets up, which cannot be done without great difficulty, he appears to stand for a time tolerably well: but on going forward, and especially when he attempts to turn, he often drops suddenly down again, as if his back were again broken. He seems to suffer intolerable pain in struggling when down to get up again. He appears anxious to stale, but is unable to stretch out, as it is termed, and appears trembling and fearful of attempting it. There is generally copious perspiration, merely, perhaps, from the pain he suffers. He is not unable to stale, especially at first, nor is the urine of an unusual colour, or very deficient in quantity; but the staling gradually becomes more frequent and the urine turbid, but of a light colour, and less in quantity. All these symptoms are occasioned by a partial and at

length a total paralysis of the bladder, an affection of the muscles of the loins, and not only that, for these again depend on a fracture of the back bone which had previously been ankylosed, or rendered stiff by disease, and a consequent pressure upon the spinal marrow, which becomes inflamed, and sometimes even suppurates. So important is the disease named *chill*, and especially what is named a violent chill, that not only the kidneys and bladder, but likewise the stomach, the lungs, the bowels, and even the heart itself, participate in the affection. Sometimes the stomach is affected in a peculiar manner. The horse refuses his food, shivers considerably, has a peculiar appearance of uneasiness, the ears and legs are at first cold, and the pulse is quick and oppressed. After some time, or if the animal is not fully relieved by a copious bleeding, a swelling takes place in one or both of the hind legs, sometimes rather suddenly, and in a considerable degree, attended with violent pain and great heat in the limb. The animal is relieved, however, from his internal pain; the shivering ceases, the pulse becomes slower and more free, and the appetite returns. If a cathartic, or dose of physic be given at this period, and the ball is so made as to dissolve readily in the stomach, the consequence is likely to be fatal. The inflammation

generally fixes on one part of the limb more than the rest; that part is generally the heel under the fetlock; it sometimes occurs, however, above the fetlock joint, affecting even the joint or the sheaths of the tendons. These swollen parts are always exquisitely painful, and the swelling terminates generally in sloughing. Sometimes enormous swellings of the legs are thus produced; and as the inflammation subsides the swelling lessens, but the limb generally remains much swollen during the animal's life. It is of the utmost importance, when a horse is attacked with these muscular affections, in whatever degree it may be, to bleed even to faintness; but when the vital organs are affected also, such an evacuation is the only means by which the animal's life can be saved. The consequence of these attacks, when sufficient bleeding is neglected, whether of the muscles in general, of the hind or fore-parts only, or even if it be confined to the feet, the consequence is such as to render the animal almost, if not altogether, useless. Hence we have founder, pummice feet, chronic lameness, chest founder, and other diseases, all which are absolutely incurable. But were the animal always bled on the first attack of those muscular affections named chills, and none of those poisonous drenches or balls given, which are commonly

employed on such occasions,—were he bled to the full extent I have named, that is, to faintness, and kept cool or even cold, instead of having clothes heaped upon him, and the stable shut up and made as warm as possible; all those consequences would be prevented, and the animal would speedily recover. A repetition of the cause, however, must be carefully avoided, as a second attack is more readily produced and more likely to prove fatal.



Chest Founder.

The existence of this disease appears to have been doubted by modern practitioners, and the lameness attributed by the ancients to this cause, have been wholly ascribed to some disorder in the foot. I was formerly of the same opinion, and, perhaps, was led into it as well as others, by the circumstance of the feet being almost always affected at the same time. In justice, however, to the moderns, I must observe, that the lamenesses commonly said to be in the shoulder are most frequently in the feet only, which has been completely demonstrated by the nerve operation; and that the ancients had but a very imperfect knowledge, even of the existence of such lamenesses.

Chest-founder is a consequence of those muscular attacks named chills, before described, and depends upon debility of the muscles of respiration, which muscles are those that support the body and advance the fore-legs. The diaphragm also is affected in this disorder, and from this circumstance, in addition to that of the disorder being worse after considerable exercise, appearing as if the lungs were concerned in the attack, it obtained the name of bastard peripneumony. The symptoms of this disorder are a contracted motion of the fore-legs, and a diminished size of the muscles of the shoulder and chest, with a general weakness of all the supporting muscles. From these circumstances it is, that when chest-founderd horses are nerved, though they are certainly relieved by the operation, for the feet are almost always affected at the same time with founder, they step out much better than they did, but still appear to go as if they must certainly come down; and upon putting them to work, I believe, they always do tumble, and are therefore not essentially benefited, unless they are allowed a long run at grass. Chest-founder then is a real, and not merely a nominal disorder; and the only thing that remains to be said of it is, that horses so affected are only fit for very moderate work in harness, and that all

the muscles of the fore parts, as well as the muscles of respiration, are so affected, as to render them unsafe and quite unfit for saddle horses. Such horses, it is to be regretted, are sometimes employed in coaches and post-chaises, and urged to exertions far beyond their strength. Chest-foundered horses are generally those that have been possessed of considerable power and spirit, and, therefore, when fed high, and urged by the whip, will for a short period appear to go on with spirit, but after standing a little time in the stable they suffer great pain, and soon run their short course and die a miserable death.

On Founder of the Feet.

Founder of the feet, like the preceding disorder, is always a consequence of excessive exertion, in whatever degree it may exist, and is never produced, as is commonly supposed, by sudden changes of temperature alone. There are two kinds of founder of the feet, the one chronic, and the other acute. The latter has been before alluded to, as a consequence of what has been commonly named a chill, and is sometimes of so serious a nature, as to cause a separation of the hoof from the foot, and sometimes even of the foot and pastern from the leg.

The disease, however, more frequently occurs in a less violent form, the foot becomes exceedingly hot and painful, insomuch, that the horse is incapable of standing, except it is for a short time to feed. The form of the foot becomes altered, losing its upright form, and falling down towards the horizontal line : at the same time, the sole, instead of remaining concave or hollow, gradually falls down, becoming at first flat and then convex. In these less violent attacks the inflammation sometimes abates, and the effused blood remains within the front part of the hoof towards the toe, until the hoof grows down. It has been before observed, that this disorder may be prevented by bleeding to faintness, on the first occurrence of the muscular exhaustion, and consequent inflammation that is termed a chill ; but when the practitioner is not consulted in time, and the feet are already affected, the best thing to be done is to employ the old operation, named bleeding in the toe, and this must be done freely, by opening the arteries as well as the veins. A gallon of blood may be drawn from this part, when the operation is properly performed, and is the most effectual remedy that can be employed. The whole of the hoof should be rasped as thin as possible, and the sole pared away with the flat part of the drawing knife, until small spots of blood begin

to appear; in short, the whole horny box must be made as thin as possible. The foot is then to be wrapped up in a large emollient poultice, which should be often renewed and kept very moist. A full dose of physic should always be given; there is not that danger to be apprehended from it in this case, that there is in that inflammatory attack of the hind leg, described in one of the preceding pages. *That* is, a translation from the stomach, and a purgative may cause its return, and then the disease may end fatally; this is a translation from the muscles only, unconnected with the vital organs, and a purgative is always of great service. As soon as the horse is able to stand and walk a little, he should be turned to grass, and then left wholly to nature. The soles will soon acquire sufficient firmness to admit of his going to grass, and no artificial defence whatever will be required. No apprehension need be felt from the whole of the crust, the front as well as the quarters having been rasped away, the sole will support the animal's weight without any pain or inconvenience, and the hoof will grow down in a proper form when the disease has been taken in season. Blisters are unnecessary, and therefore should never be employed. If the remedies above prescribed are unequal to the cure, the disease must be considered incurable, and

nothing further should be attempted. Chronic founder is so very common a disorder, especially in this country, that nearly two-thirds of our horses by the time they have been in work one year, are more or less affected by it. This almost incredible frequency of chronic lameness can only be referred to two causes; shoeing has nothing whatever to do with it. The first, is the general practice of breaking young horses and putting them to work before they are four years old, and often before they are three. The second, is the immoderate and violent exertions in which they are commonly employed. This kind of founder appears in a variety of forms, and has in consequence obtained a variety of names. A morbid heat in the foot is the most conspicuous symptom; this sometimes causes the heels of the hoof to approach each other and to compress the sensible frog, sometimes causing a discharge from that part; the disease has been then named contraction of the heels and thrush. Sometimes the sole of the foot has become convex or projecting, and so thin as to be incapable of affording protection to the sensible sole. The disease is then named pummice-foot, or the ball of the foot is said to have fallen down. Sometimes the hoof and the sole have acquired such a degree of thickness, that their elasticity is wholly lost, and the inclosed parts

are suffering more or less from compression. In this case there is seldom any alteration in the form of the hoof, the lameness therefore is attributed to a strain in the shoulder, or the horse is said to be chest-foundered. Sometimes the lateral cartilages become ossified, in which case the lameness is only occasional—the horse is then said to have ring bones. In short, chronic founder is a slow and almost imperceptible inflammation of the foot, producing all this variety of appearance, and obtaining different names. Palliation, or temporary relief, is the only good that can generally be accomplished. Contraction of the heels and quarters, and consequent thrushes, may with certainty be cured, but the lameness will almost always continue. Thrushes, however, may arise from other causes, which will be noticed hereafter. Pumice foot may be relieved by defending the thin and tender sole by a suitable shoe; but the form of the foot cannot be essentially altered. Compression of the sensible foot by a thick inelastic hoof, may be completely, and sometimes permanently cured, by rasping the whole hoof, and paring the sole until they become so thin as to bleed, and keeping the horse at grass until a new hoof grows down. One thing should be observed of chronic lameness, that when it exists in a slight degree, considerable relief may

be obtained by thinning the soles and keeping them stopped with moistened clay and not with cow dung, as is commonly done, as that is of a putrescent nature and liable to injure the frog, and this may be done even with clay when the frog is already soft and moist; in that case, therefore, it should be covered with the hoof ointment. By thus keeping the feet moist and cool some relief may be afforded in almost all cases of chronic founder, and may enable the horse to work moderately. But it is sometimes so bad, and the animal is constantly suffering so much pain, that nothing can afford relief but the nerve operation.

To enumerate all the cruelties and contrivances that have been at different times practised for the cure of chronic founder, is not now necessary, because it appears to be universally known that none of them can do any good. This disease, in former times, was commonly named hoof-bound, and that dreadfully painful operation of tearing off the sole was then commonly practised. The cruelty and inutility of this operation has been completely discovered, and is now quite given up; but it has been succeeded by firing, blistering, and mechanical contrivances for forcing open the contracted heels; and this contraction of the heels has been generally considered as the sole cause of the

lameness. Mr. Coleman, however, soon discovered that the contraction can always be removed with certainty, and a new and perfect hoof formed, but that the lameness was incurable. All the mechanical contrivances that have been suggested are useless, to say the best of them. Firing and blistering are, I fear, still employed on those occasions, especially the latter. Neither of them can possibly do any good in any disease whatever of the foot; to employ them, therefore, when there is no other *visible* cause for their application, is an unnecessary infliction of severe pain, and a useless expence to the proprietor. A run at grass is after all the best palliative, except the operation I am now going to describe, which is known by the name of the nerve operation.

On the Nerve Operation.

This operation is said to have been discovered by Mr. Sewel, Assistant Professor of the Veterinary College. Mr. Sewel may truly be said to be the person who first applied the operation to any practical purpose, but the discovery was made, I believe, by Mr. Coleman. He desired Mr. Sewel to make the experiment, he did so,

but concealed the result of it, not only from Mr. Coleman, but from every one except those from whom he could not conceal it, that is, the men who threw down and secured the horse for him. They communicated the secret to Mr. Coleman, and he not only reprimanded Mr. Sewel, but made him publish it in the *Philosophical Transactions*; and that society rewarded Mr. Sewel for it, by making him an honorary member. This operation consists in cutting out a portion of one of the pastern nerves on each side. The portion cut out, he directs, should be one inch or more. Now as there are several branches of nerve on each side the pastern, though one only of considerable size, cutting out a portion of that one must leave some degree of sensibility in the foot. The removal, however, of this one portion, will always afford complete relief for a time, that is, when the lameness is wholly in the foot. But the smaller branches will gradually enlarge, and in time convey the same quantity of nervous fluid to the foot which was originally conveyed by the large nerve. The lameness, therefore, has, I believe, in every case, sooner or later, returned, and the operation has fallen into disuse. Mr. Sewel, who formerly practised at Bath, but now at St. Alban's, was the first to improve, as he thought, upon this operation. He cut out a

portion of the metacarpal nerve, just at the part where windgalls form; but having opened a windgall during one of his operations, was so alarmed at what he had done that he changed the situation in future operations to about two or three inches above that part. He was not aware, I suppose, of a branch of nerve passing over the back sinew above the part where he operated, by which a communication was kept up after his operation; this branch also gradually enlarges when a portion of the trunk has been removed, so that the horses, sooner or later after his operation, became as lame as at first. I experienced a failure of this operation, and then repeated it on the same horse lower down, but on one side only, so as to remove a portion of nerve below the part where this branch communicates. This completely answered the purpose for a time, but after about twelve months the original lameness ended badly, as I shall have occasion to describe hereafter. The situation now preferred for the operation is, I believe, the part where windgalls form, and it was by meeting with a similar accident to that which deterred Mr. Sewell from again operating in this part, that I first discovered that windgalls may be punctured with safety. But the effect of the nerve operation, even in this situation, must also necessarily be

of limited duration; for above this part also branches are given off, which gradually enlarge, and in time restore sensibility to the foot. To perform the nerve operation so as to render the foot completely and permanently insensible, the following directions must be followed; for it is the best and easiest method I am acquainted with, and will uniformly produce the desired effect. The incision should begin between three and four inches above the fetlock joint, that is, the most prominent part of the side of the joint, and extend downwards for one inch only. By making a free incision in that space that is felt between the bone and ligament, and the tendon, the nerve may be almost immediately exposed; it is only necessary to dissect off a little cellular membrane, and then it will be distinctly seen; one inch or more of the nerve is usually cut out, but I believe half an inch will do just as well. Thus the foot may be rendered absolutely insensible, and the lameness cured, if a proper subject has been chosen for the operation. But if the subject is unfit, it may do some good, for even in this case the horse will not go lame until the hoof is worn off, or he comes down upon his fetlock joint. There are many circumstances to be considered with respect the nerve operation, and it is a subject of such importance as to demand a full and

impartial consideration. Before this operation is performed, all the circumstances of the case should be carefully inquired into. If the foot is considerably deformed, if the front of the hoof has departed from the proper line of obliquity and approached towards the horizontal line, as will be explained by a diagram, (p. 162.) then a corresponding deformity will be found in the sole. These appearances indicate a disease of the sensible foot, which will proceed in its destructive career more or less quickly, according to the horse's work, until he comes down upon his heels and from thence upon his fetlock joint, and then of course he is unfit for every purpose. Horses are sometimes lame from an ankylosis, or stiffness of the coffin joint; sometimes in consequence of picking up a nail, as it is termed. After the wound that has been thus inflicted is completely healed, a permanent lameness often remains, which sometimes is not so considerable as to prevent a horse from doing moderate work, especially in harness. The same effect, however, is more commonly produced by slow inflammation of the coffin joint and parts connected with it, by excessive work: it is also an effect or symptom of chronic founder. In all such cases the nerve operation is not applicable, and may do injury. For though the horse would be immediately relieved

by nerving, yet when put to work he would step out incautiously, and sooner or later fracture the adventitious ossification, and come down upon his fetlock joint. Mr. Turner, Veterinary Surgeon of Croydon, is of opinion, that a much greater number of lame or foundered horses are thus affected than is commonly supposed, and states the proportion to be no less than nineteen in twenty. Mr. Bracey Clarke, however, who is a very accurate observer and a diligent inquirer after truth, states, that he has examined many lame horses after death, and finds the proportion to be much less than this, and not more than one in sixteen. I have not examined the feet of lame horses after death with a view to ascertain this point, but I cannot help thinking that they are both wrong, and that the proportion would have been nearer the mark, as it commonly is when the difference is so great, had it been placed between the two. If I were to give an opinion from what I have observed, in examining bones at the different kennels, it would certainly be in favour of Mr. Bracey Clarke's statement. However this may be, it is not of so much importance with regard to the operation considered in itself only, for the nerve operation should never be performed unless the horse is so lame as to be unfit for work, and then, if this fracture should take place and the

horse come down upon his fetlock joint, he is no worse than he was before the operation, that is, absolutely useless. But if a veterinary surgeon operates upon an unfit subject, and the case terminates unfavourably, it not only brings the operation into disrepute, but the practitioner also, if he should have led the proprietor to expect a favourable result. This may not be the case at present, as the operation is as yet in its infancy: but practitioners should be cautious as to the prognosis they give, and as to the subjects they choose for the operation. Ossification of the coffin joint general begins within the navicula, or nut bone; sometimes it occurs between the coffin and small pastern, it may also affect both: the lameness, therefore, which it occasions is of various degrees, and may not prevent a horse from doing moderate work. There are seldom any external appearances by which its existence can be known, but sometimes there is a thickening and morbid heat about the coronet, accompanied by a short step, so that a horse is unable to trot, but goes tolerably well in the walk. It is worthy of remark, that the nerve operation with post-masters and coach proprietors is got into general disrepute, and for this obvious reason, that it has not succeeded in the horses they have had nerved. These horses have always been unfit subjects for the

operation. When they have a lame horse they continue to work him in their coaches and chaises as long as he has a leg to stand upon, without regard to the pain the animal suffers, or his utter unfitness for the employment. But by dint of whipping and high feeding, they contrive to keep him upon his legs for a short period, and when nearly exhausted, or done up, not only in the feet but in the whole muscular system, they expected from nerving a complete renovation. In many instances, however, such horses, that is, both post and coach horses, have been enabled to work again for many months after the operation; but it has generally, I believe, terminated either in the loss of the hoof, or in breaking down, as it may truly be called; for the fetlock joint comes down upon the ground, and of course they are then absolutely useless. Thus, then, the nerve operation may prove unsuccessful from being performed on improper subjects, and the unfavourable termination is of two kinds. In the one, the horse breaks down, in the other, he loses the hoof. This last termination may happen at different periods, varying, perhaps, from one month to two, or three years. Breaking down, in consequence of the nerve operation, depends upon the foot being previously in that state which is called pummice-foot; or from the ball of the

foot being down, as it is termed, or from an ossification in the coffin joint, or in the articulation between the small and large pastern. These states of the sensible foot often exist together, and when the horse steps out more boldly in consequence of being relieved by the nerve operation, the ossified joints are generally, and I believe I may say always, fractured, sooner or later, and then the horse breaks down, as I have described. It should be observed, that it sometimes happens that a horse becomes strained in the back sinews, as it is termed, after the nerve operation; that is, a painful swelling takes place in what is called the sheath of the tendon. This also arises from the horse stepping out freely, after the parts had for some time been unaccustomed to such extension; in doing which, he breaks that vascular ligamentous and delicate membrane which connects the perforatus tendon with the perforans, about mid-way in the leg. A similar band may be found also between those two tendons in the pastern. I have known this accident occur in a nerved horse at grass, and he got well again and continued his work. Loss of the hoof, the other unfavourable termination of the nerve operation, may depend on one of the two following circumstances. If a horse after being nerved happens to be pricked in shoeing, or if

he becomes gravelled, as it is termed, such accidents do not occasion lameness, and therefore sometimes escape notice until matter has formed in consequence, which, from being confined by the horn, often penetrates between the sensible foot and the hoof, so as to separate them, either wholly or partially. In this case, the foot may be restored when it arises wholly from either of the above causes. Sometimes, however, it depends not wholly upon this circumstance, but upon another also of far greater importance. It has been a subject of admiration and astonishment, that although the nervous communication with the foot has been completely cut off, the secreting arteries, as they are termed, not only continue to perform their functions, but perform them more freely and with more ease; there being more hoof formed, and that too, frequently of a better quality, that is, less brittle and more elastic than that which they formed previous to the operation. This, I believe, has never been explained by any one, and to understand it, it is necessary that the reader should recollect what has been said on the subject of the brain and nerves at page 104. It has there been stated that the heart is entirely supplied with nerve, by the eighth pair or par vagum. This supply is extended to the arteries throughout all the circulation, and at their extremities

furnishes them with that power, on which their functions depend, that is, secretion. This may be called their sensorial power. Their sentient power is another thing; this they derive from the spinal nerve, which is cut away in the operation. The secretion of hoof is a circumstance that is not generally understood. When we consider the quantity of horn that is formed, the purposes it is designed for, and the qualities with which it is endued, it will then appear what a quantity of blood is required for the purpose, and what power also in the secreting arteries. The excessive exertions in which horses are generally employed in this country are such that their sensorial power is greatly diminished at an early period of life, and that more especially by the absurd and ruinous practice of breaking and working them as early as they do. From this cause, and from the vessels of the foot having their action so much increased, in those violent exertions, the loss of their sensorial power would not be an uncommon occurrence, and the loss of the hoof would of course be often happening, without the nerve operation, were it not for the additional supply of sensorial power they derive from the metacarpal nerve, through its connexion with the great sympathetic. Therefore it is that post and stage-coach horses more frequently lose

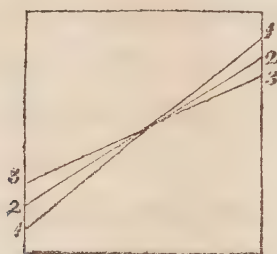
their hoofs after the nerve operation than others; for they are the horses that are most commonly and most constantly employed in hard work, are often purchased in a state of lameness or debility, and too frequently made to continue their labour until they are completely exhausted. Such are the horses that have been the principal cause of bringing the nerve operation into disrepute. With hunters the operation has, I have been informed, in two cases, so far succeeded, as to enable them to return to their work for two seasons. Horses employed in hunting, work harder than coach or post-horses at times, but they are treated with care, and the slightest lameness is always attended to, and obtains for them sufficient rest. A real sportsman knows the value of his horse, has a regard for his feelings, and never pushes him but when there is occasion for so doing. We sometimes hear, it is true, of young and inconsiderate sportsmen riding a horse until he drops from complete exhaustion, and of some who have been foolish enough to boast of such an exploit. But this is not often the case; on the contrary, they are generally treated with care, and are allowed a summer's rest at grass to recruit their sensorial power, and return to their labour with spirit and energy. Having pointed out the causes of the failure of nerve operation, I

shall conclude the subject by making some general observations on its usefulness, which I am satisfied is considerable, and of great importance to society. In determining upon the expediency of performing the nerve operation, it is necessary to consider, not only what probability there is of its being successful, or in what degree it may be so, but likewise whether the chance of cure is equal to the expense of the operation and that of keeping the horse before he is fit for work. I say expence of the operation, for the after treatment should cost nothing, as no kind of dressings or bandages are required. The only thing to be done after the operation, is to close the skin with one stitch, and then leave it wholly to nature, except during the first week, it will be proper to sponge the leg several times a day with tepid water. After this the part should not be touched on any account. The stitch will give way, and the wound appear open after the fourth day; but this should never be attended to. The expence of keep need not be considerable, for after the first week, or even before, he may be turned to grass, where he should be kept two months; he then may be put to work. Now, if the expence of the operation, and the expence of keep can be afforded, there can be no objection whatever to the operation. Relief from pain

and lameness is in almost all cases immediate and certain, and the duration of this relief, if limited, may extend to a period of some months, or even years, and so complete is this relief, that during this period, the horse may do considerable work, without suffering pain. But there are cases of lameness, where the relief it affords is complete and permanent. These cases may be known by there being no deformity in the hoof, no ossifications about the coronet or pastern, no particular appearance of injury about the fetlock joints, and when he has not been exposed to excessive exertions, especially at an early period of life; and this, perhaps, can only be known by inquiring into the history of the animal. Were a horse kept at grass until he is five years old, the exertions which now ruin him, and commonly do him up, as it is termed, in two or three years, would do him no injury. As it is, they are generally taken up at three years old, seldom left out till four, and often put to work even at two. While breeders and proprietors are so blind to their own interest as to go on in this way, and while horses are worked as they now are, the nerve operation may be considered a valuable addition to our stock of veterinary knowledge. One good, I hope, will result from it, in addition to what I have described; that

is, it will completely put a stop to the cruel practice of firing horses, in cases where it cannot possibly do any good.

Diagram to show the different degrees of obliquity in the hoof, as it regards the nerve operation.



Figures 1, 1. The line showing the healthy degree of obliquity.

Figures 2, 2. The first degree of pummice foot.

Figures 3, 3. The greatest degree of pummice foot.

*Explanation of the Plate of the Nerve
Operation. [Plate I.]*

This plate of the nerve operation shows the two methods that have been commonly employed in performing the nerve operation. The method I now recommend may be understood

Fig. 1.

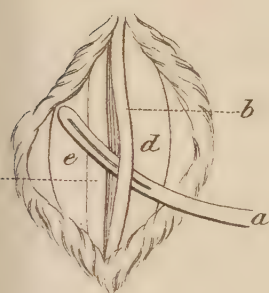
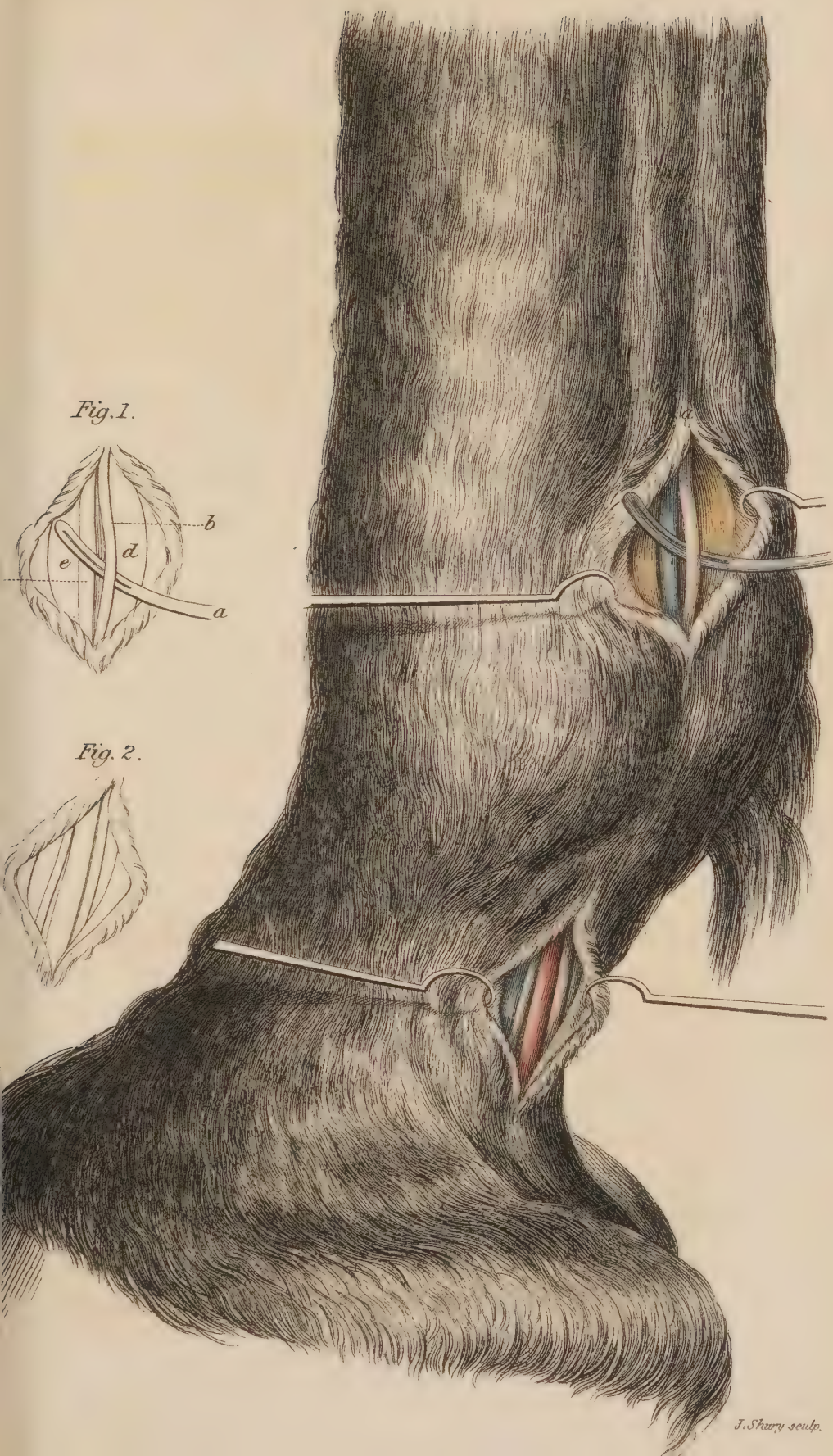


Fig. 2.



also by the same plate. It is of importance to observe that the nerve should be divided with a keen knife (a curved bistoury, when it cuts well, is the most convenient), but by a drawing cut, so as to derange the nerve as little as possible. When it is done with scissars, there is a thickening always left, which is extremely tender, and sometimes productive of lameness, especially when struck.

Description of Figure 1.

- a.* Part of an eye-probe bent, and the curved part passed under the nerve.
- b.* The nerve.
- c.* The vein.
- d.* The back sinew.
- e.* The suspensory ligament.

*Description of Figure 2, or the Pastern
Operation.*

This is best explained by the plate itself, instead of the outline, fig. 2. The skin is drawn back by two hooks. The artery is coloured red, the vein blue. The large branch of the nerve is seen behind, and close to the artery; a smaller branch is shown between the artery and vein.

I have lately performed the operation in a higher situation than that marked in the plate ; that is, at the top of the incision marked letter *a*, in the plate. When performed in this part, the nervous communication with the foot is more completely cut off, and the cicatrix is quite out of the way of being struck with the other foot. In this part the nerve lies rather deeper, especially on the inside of the leg, than it does nearer the fetlock joint, but there is no difficulty in finding it by carefully dissecting away a little cellular membrane. Half an inch of the nerve is quite sufficient to be cut out, and the incision in the skin need not exceed one inch. The operation must be performed on both sides of each leg, for the metacarpal nerves do not correspond with the artery. After the nerve has been cut out, the wound should be closed with one stitch, and no kind of bandage, plaster, or dressing, should ever be employed. During the first week, the leg should be spunged with tepid water, several times a day, and then he may be turned to grass, where he should be kept two months. The stitch ulcerates and gives way in four days, and the wound opens ; but this need not be attended to.

CHAPTER XXII.

ON STRAINS.

By the term strain is generally understood the excessive extension of a part, and the parts commonly considered as liable to such accidents are the muscles, the ligaments, and the tendons with their appendages. This opinion is correct, as far as it goes, but strains are generally of a more serious nature, and depend on a rupture of some of those parts. It is unnecessary to dwell long on this subject; the nature of those accidents has been already explained in a general way, and to speak generally of the cure, still fewer words are necessary. Bleeding to the extent of six quarts or two gallons, is the first remedy to be employed, but not the most essential; for without rest, absolute rest, until the inflammation has subsided, nothing can do any good. It may be supposed that this copious bleeding is applicable only to severe strains, or strains of important parts; but it is the best practice in all strains, in whatever part they may occur, or in whatever degree. With respect to strains of particular parts, though the essential remedies, bleeding and rest, are in all

of them necessary; the situation of the part may admit of some variation, in the use of local or subordinate remedies; a description of each may also be necessary; therefore, as in the former editions, each will have a separate consideration.

Strain of the Shoulder.

Injuries of the shoulder occur more frequently than veterinary surgeons seem disposed to admit; they do not, however, often occur in that degree, as to constitute what may be called a strain. Young horses, during the time of breaking, are generally the subjects of such accidents, especially when they are taken up and broken at the early age they now commonly are. They are not, it is true, often so violently strained, that the lameness comes under that denomination, but the lameness of colts is almost always of this nature; and, unless it is violent, and the lameness such as to prevent the extension of the limb, rest alone, by turning them to grass, will effectually restore them again. Shoulder strains often occur to troop horses, but then the disease is so well known, and so judiciously treated, that nothing need be said on the subject. A shoulder strain may be distinguished by the

difficulty with which the animal extends the limb, but especially in moving forward, by an apparent motion of the fore-leg outward in a curvilinear direction. This, however, is only apparent, and is occasioned by his throwing himself on the opposite shoulder in order to take off the weight as much as possible from that which is strained. In doing this he inclines his head and neck on one side, and it is thus the fore-foot describes a curve in moving forward. In violent strains, the difficulty of moving the limb is such as to prevent extension almost entirely. At others it is inconsiderable, and attributed to a splent or a strain of the fetlock joint. As to the treatment of this kind of strain, whether it be violent or not, the remedies are the same, that is, copious bleeding and rest. The rest should be continued as long as the animal feels it necessary, for he should be kept loose in a box where he may either move or stand still, as may be most suitable to his feelings. It may be thought that copious bleeding in strains, which are not violent, is unnecessary, and that rest alone may be sufficient. But if it is desirable to cure the animal in the speediest way possible, then bleeding, and copious bleeding, should never be omitted. The horse diet should be light, and of an opening nature; grass is by far the best. A dose of physic may be given, A rowel, or rather a seton in the

chest, is useful. No other application whatever is necessary. As for those vile farragos, named strain oils, it is to be hoped they will be completely expunged from our materia medica, as much on account of the useless expence to which proprietors are frequently put in purchasing them, as of the mischief they frequently do. When the inflammation has so far abated, that the horse appears capable of moving himself with some degree of ease, he should be turned into a small paddock, when his exercise may be increased, and from thence, where he is fit for the change, into a field. In violent shoulder strains, the muscles are sometimes ruptured or torn. In this case some time is required for their healing, and rest is more particularly necessary. When this has been accomplished, lameness will often remain for a considerable time, the muscle having become shortened, in some degree, or its action more confined. In such cases swimming has been proposed with a view to a gradual restoration of the contracted muscle. The advantage of this will readily appear, when it is considered that the affected muscle is one of those concerned in the support of the body. In swimming then, the full extent of the limb may be obtained, while the weight of the body is supported by the water. I have known complete

CHAPTER XXXII.

OBSERVATIONS ON THE STRUCTURE, ECONOMY,
AND DISEASES OF THE HORSE'S EYE.

OF all the organs of the body, the eye is by far the most delicate and interesting in its structure and economy, and though a knowledge of this subject may lead to the prevention of its diseases, it will do but little towards curing them. Sometimes, indeed often, a temporary cure is effected, and the eye may appear free from disease a considerable time; but the disorder always returns sooner or later, and eventually produces blindness, or imperfect sight, in one or both eyes. In describing the anatomy and physiology of the eye, the most convenient method is to divide the subject into two parts, that is, the eye itself, and its appendages. Under the latter head is comprehended the eye-lids, the muscles which move it, the eye-lashes, the lachrymal gland, the puncta lachrymalia, and lachrymal duct, the caruncle of the eye, the haw and the membrane, named conjunctiva, and the muscles by which the eye is moved.

The palpebræ, or eye-lids, are opened and

shut by two kinds or orders of muscles. The one composed of circular fibres, and named orbicularis, is situated immediately under the skin, and, by contracting, closes the eye-lids; the other, named levator, is composed of straight fibres, is situated under the upper eye-lid, and, by contracting, opens the eye-lids. The margin of the eye-lids is smooth and thickened, and secretes a mucous fluid, as well as the hairs named cilia or eye-lashes. In the horse there is only one eye-lash, that is, the superior, which serves to keep out dust from the eye, and moderate the light which comes directly from the sun, without offering any impediment to the reflected light, which comes from the surface of the earth. Immediately under the superior part of the orbit, or socket of the eye, and rather towards the inner corner, there is a gland of considerable size, which forms the fluid named tears. This fluid is, by the motions of the eye, made to filtrate through the under surface of the upper eye-lid, and is then diffused all over the eye, by the motion of the eye-lids, as well as by the motion of the eye itself. As the tears accumulate, they are directed, by the closing of the eye-lids, towards the inner corner, where they are received by the open extremities of two ducts which, soon uniting, form the lachrymal duct, a long membranous tube which termi-

nates in the lower part of the nostril, where it may be distinctly seen, with the fluid named tears, flowing from it. The inner surface of the eye-lids is formed by the membrane, named conjunctiva, or *membrana conjunctiva*, which passing inward, embraces the globe of the eye, and serves to keep it in its situation, at the same time it is sufficiently loose to admit readily of all its various motions. This membrane, in its healthy state, is nearly white; but in all cases of internal inflammation, or inflammatory fever, becomes very red. In staggers, and some other disorders of the stomach, and organs subservient to digestion, it becomes of a deep yellow or orange colour. This membrane is closely united to nearly one half of the sclerotic coat, or white of the eye, and has been thought to be continued in a very attenuated and transparent state over the cornea also; but this is not the case; that is, it cannot be demonstrated. In injuries of the eye, this membrane becomes red; but, in internal diseases, it should always be examined, as redness in that case indicates general inflammatory action, and points out the necessity of copious bleeding. In the inflammatory disorders of cows, this redness does not take place, nor is any yellowness observable in the disorders of the digestive organs; this is owing to the density of the membrane, and to

the dark or dusky colour of the sclerotic coat, which is not white as in other animals; in all cases of internal inflammation in cows, the larger vessels of the conjunctiva may be seen in a state of distension.

In sheep the redness is observable, especially in the latter stages of the disorder, named gid or giddiness, or hydrocephalus, from hydatids, in one of the ventricles of the brain. (See vol. iv.) In the inner corner of the eye there is a small fleshy eminence, named caruncle, which separates the two open extremities of the lachrymal ducts, named puncta lachrymalia, and thus allow the tears to be forced into them by the contractions of the orbicular muscle. In the human eye, the tears pass from the puncta lachrymalia into a small bladder or sac, which does not exist in the horse; in him there is one continued membranous tube from the inner corner of the eye, to the lower part of the nostril. The termination of the lachrymal tube, or duct, in the horse, has often been mistaken for an ulcer in horses suspected of glanders; but it does sometimes become ulcerated from the acrimony of the tears, or from the strong preparations that are sometimes applied in diseases of the eye. I have seen this happen from the application of powdered sal ammoniac (muriate of ammonia) to the eye. Sometimes the termina-

tion, or orifice of the lachrymal duct, becomes closed by inflammation, or the cicatrization of an ulcer, and then it bursts above, and the ruptured part becomes an ulcer. According to Lafossé, the disease, named *fistula lachrymalis*, takes place in the horse; but this I have never seen. In glanders, however, there is often, indeed generally, a slight purulent, or mucous, discharge from the inner corner of the eye, which probably proceeds from the lachrymal duct. The *membrana nictitans*, or haw, as it is commonly named, is situated in the inner corner of the eye. That part which comes over the eye is a thin slippery membrane, which, towards its basis, becomes thicker, and cartilaginous. Its basis is of some thickness, and imbedded in fat; there are no muscles attached to it; but when the eye is drawn into the orbit, and towards the inner corner, the basis of the haw is prevented from following it, by the bones of the orbit; the thin membranous part of the haw is thus forced over the eye, and serves to remove dust or flies that may have fallen upon the cornea.

The eye is moved by seven muscles, which arise from within the orbit, or socket, and terminate in thin sheets of tendon, which, with the sclerotic coat and conjunctiva, form what is called the white of the eye. There are two muscles to move the eye upward, and two to

move it downward; one to move it obliquely outward, and one to move it obliquely inward. This last is worthy of particular notice, for in the horse, as in the human eye, its tendon, which is longer than the rest, instead of being attached like the others to the sclerotic coat, first passes through a hole in the superior part of the orbit, it then turns inwards, and is inserted into the sclerotic coat. By this contrivance, a greater degree of motion is produced in the eye, in an oblique direction outward, so as to make the eye express the passions of the mind. This muscle enables the horse to look behind him, and is often exerted in vicious horses, making them looking sour or suspicious, and show the white of the eye.

In the horse there is a seventh muscle, named retractor, which arises from the bottom of the orbit, surrounds the optic nerve, and is inserted into the posterior part of the globe of the eye, or sclerotic coat, about midway between the optic nerve and the cornea. Its use is to draw the eye into the orbit, which it does with considerable force. The various motions of the eye are rendered easy by its being imbedded in fat.

Having described the appendages, as they are termed, I shall proceed to a description of the eye itself, the structure and economy of which is most curious and interesting. It is said to be

composed of coats and humours, and this perhaps is the best manner of considering it. The first coat that appears is the cornea, or glass of the eye, which forms the anterior part, and is beautifully transparent. It is not of a circular form, as in man, but of an irregular oval, or rather oblong form, when examined out of the socket ; but in its natural situation in the living horse, that part which projects beyond the eye-lids is a regular oval, or rather of an oblong form, and corresponding in some degree with the form of the pupil. It forms a larger portion of the globe of the eye than in man, and by its convexity, causes the rays of light which pass through it to converge towards the pupil. This convexity may be too great or too little, and in either case render vision somewhat imperfect, and cause starting. The convexity of the cornea is preserved by the fluid which it incloses, named aqueous humour. On puncturing the cornea this fluid escapes, and then the cornea becomes flat and wrinkled. On removing the cornea the iris appears, which is a thin delicate muscle, with an oblong hole in the centre, named pupil. The iris is composed of two orders of fibres; the one, circular, which, by contracting, diminishes, and even closes the aperture in the centre, named pupil; the other radiated, which, by contracting, opens or enlarges the aperture or pupil. The second hu-

mour of the eye is situated immediately behind the pupil, and is named crystalline humour, or crystalline lens. On taking it out it appears to be a solid and beautifully transparent double convex lens, the posterior surface of which is more convex than the anterior surface. It is found to become denser and denser from the circumference to the centre, and the slightest pressure so deranges it, as to lessen or destroy its transparency.

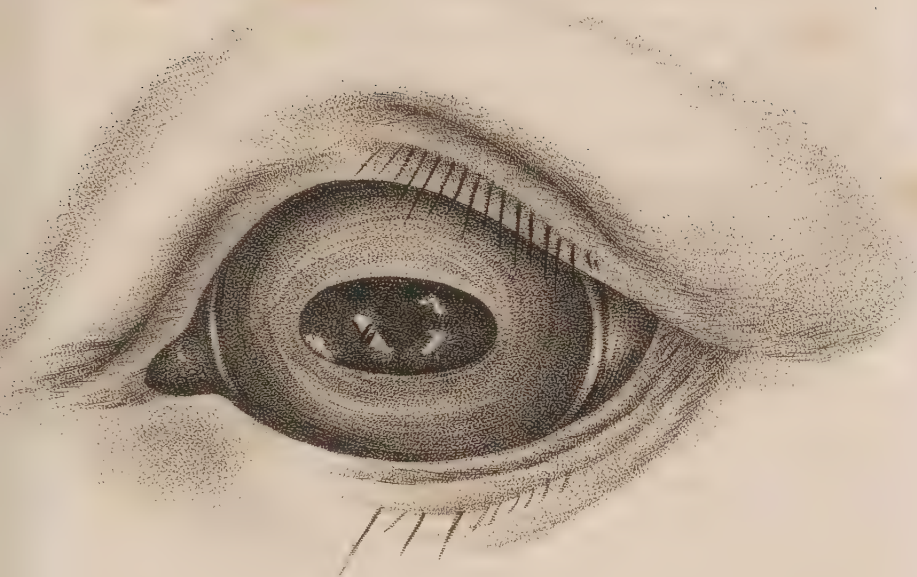
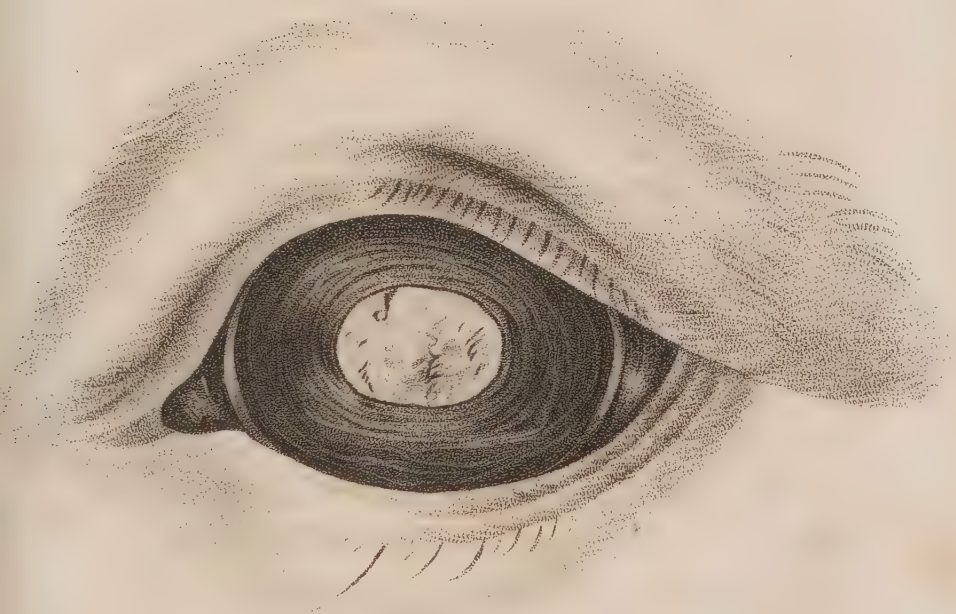
The crystalline humour may be considered as composed of numerous concavo-convex lenses, admirably fitted to each other; those of the largest size having their circumference or edge opposed to and nicely joined to each other, thus forming altogether a double convex lens. The point of union between the two largest lenses is embraced by a band of muscular fibres, disposed in a circular direction, and named ciliary ligament. These, by contracting, increase the convexity of the crystalline lens, or rather of the series of concavo-convex lenses of which it is composed, in a manner so just and equal, as to adapt it to the distance of the object at which the animal is looking, while, by the relaxation of these muscular fibres, the convexity of the lens is diminished by its own elasticity. These changes take place with inconceivable rapidity and accuracy. There are other muscular fibres going from the band of circular fibres, named

ciliary processes, in a straight, or rather radiated, direction, towards the second coat of the eye, named tunica choroides; these are so arranged as to be drawn into folds, by which disposition they are enabled to perform their office more easily, which is that of drawing the lens towards the optic nerve, and thereby increasing the intensity of vision, whereby the animal is enabled to see small objects distinctly. The crystalline lens is inclosed in a transparent capsule, which is not in contact with it, there being about one drop, as it is computed, of a transparent liquid interposed, which, from the anatomist's name who first observed it, has been called liquor Morgagnii.

I have seen a case where the convexity of the lens has been so increased, by an unusual degree of contraction of the circular fibres, named ciliary ligament, that it burst the capsule, and was forced out of its situation. I found it lying with its posterior convex surface on the inferior margin of the iris; about half of it appearing in the anterior chamber of the eye, as it is termed. The transparency of the lens was not affected, at least it appeared so to me, and I rather think the accident had occurred just at the time I observed it, from twitching the horse violently. In cataract, a disorder in which the crystalline

lens becomes opaque, it always becomes globular in its form from an irritable state of the band of circular fibres; the same effect may be observed in the circular fibres of the iris, causing the pupil to be small, even in a moderate light, while the inflammation is going on which occasions the cataract; but when the opacity is such as to exclude the light from the posterior part of the eye, which contains the third or vitreous humour, with the choroid coat, retina and optic nerve, then the circular fibres relax, and the radiated fibres draw up the iris somewhat irregularly, which adhering to the capsule of the opaque lens, the pupil remains permanently open, as in fig. 2, Plate IV.

In the human eye the pupil is black, and of a circular form, and forms what is commonly called the apple of the eye. In the horse, it is of a dark blue colour, and of an oblong figure, with its long diameter always parallel to the horizon, in whatever position the head may be placed. This uniform parallelism of the long diameter of the pupil with the horizon, is effected by means of the oblique muscles before described. In Plate III, fig. 1, an error may be observed in this part, for the long diameter of the pupil, instead of being parallel with the horizon, has been drawn a little obliquely.

Fig. 1.*Fig. 2.**J. Shury sculp.*



similar error may be observed in fig. 1, Plate IV, but in a less degree. See rough sketch of the Eye, page 266.

When the horse stands in the stable, in a moderate light, the pupil is open or large, by the preponderant action of the radiated fibres, as in Plate III, fig. 1, or as in the rough sketch; but when taken out of the stable, the circular fibres prevail, and the pupil becomes much smaller, as in Plate III, fig. 2; and if the eye be exposed to the sunshine, the pupil becomes smaller still, and scarcely perceptible.

When the nervous structure of the eye is morbidly irritable, as in ophthalmia, the pupil continues small, and sometimes nearly closed, even in a moderate light. But when the lens becomes opaque, the ophthalmia and morbid irritability cease, and the pupil then becomes open and irregular in its form, as in Plate IV, fig. 2. Plate IV, fig. 1, represents a partial opacity of the lens, or partial contract; or, as it is more commonly called, specks in the pupil: here the form of the pupil is not altered, and it remains capable of contracting or opening, according to the degree of light it is exposed to.

All that part of the eye which is posterior to the iris, is chiefly occupied by the third, or vitreous humour, and it is in this humour that the crystalline lens is imbedded. The vitreous

humour is perfectly transparent, and consists of a fluid, inclosed in numerous small transparent cells, all of which appear to be inclosed in one delicate transparent membrane, named tunica arachnoidea. If the vitreous humour is cut, by snipping it with scissars, a fluid, like water, drops from it freely, so that it appears to be nothing more than water, probably holding a little salt in solution, which escapes when the transparent cells are thus cut open.

That part of the vitreous humour in which the lens is imbedded, is different from the other parts, and of the consistence of jelly. Immediately behind the ciliary ligament, as it is termed, the arachnoid coat may be inflated with a small blow pipe, and made to resemble a circular canal; this has been called, from the name of the person who first observed it, the circular canal of Petit. It is supposed to be connected with the radiated fibres of the iris. I have seen the whole of this humour in the eye of a sheep that had an hydatid in the right ventricle of the brain, of the consistence of jelly.

It is now time to speak of the optic nerve, and its appendage, the retina, with the third coat of the eye, named tunica choroides. The retina is a delicate transparent membrane, which embraces the vitreous humour, and is supposed to be an expansion or production of the optic

nerve, serving to receive the impressions of objects, in order that they may be conveyed by the optic nerve to the organ of vision, named *thalamus nervi optici*, or speaking of both organs, *thalami nervorum opticorum*. After death, the retina becomes opaque, and of a light grey colour. It is so delicate a membrane, that there is some difficulty in preserving it for exhibition, unless the eye is quite fresh. Under the retina lies the choroid coat, which is nothing more than a plexus of blood vessels, covered with a mucous substance of different colours. In the human eye it is black, which is the cause of the human pupil, or apple of the eye, appearing black; but in the horse it is variegated with mucus of a purple, a blue, a green, and a black colour, which, blending together, causes the pupil to appear of a dark blue colour. This mixture of colours in the bottom of the eye, or choroid coat, has been named *tappetum lucidum*.

The last and most considerable coat of the eye is the sclerotic coat, which is a very strong thick membrane, including all the other coats and humours, except the cornea. The sclerotic coat forms the greater portion of the globe of the eye, and is intimately united towards the anterior part with the cornea, which may be viewed as bearing the same relation to the sclerotic

coat, as the glass of a watch does to the case. By maceration in water the cornea separates from the sclerotic coat completely.

In the horse there are black pendulous bodies attached to the superior margin of the iris. These serve, like the cilium, or upper eye-lash, to moderate or exclude the direct rays of light which proceed from the sun, without interrupting those which are reflected by the surface of the earth : by this admirable provision they see what it is necessary they should see, while the too powerful stimulus of the direct rays from the sun are excluded, or sufficiently moderated. These black bodies enable the animal also to close the pupil completely, and thus occasionally, or when the nervous structure of the eye is morbidly irritable, exclude the light altogether. The optic nerve penetrates the posterior part of the eye, not in the centre, but rather inwardly ; still, however, it is central with respect to the axis of vision, for both eyes are always exerted in looking at objects, and, in doing this, incline a little inwardly, so as to make the optic nerve central with respect to the object, or rather as to the axis of vision.

Anatomists have supposed that, were this the case, the insertion of the optic nerve would cause a dark spot to appear before the eye, and

that the nerve therefore enters a little inwardly. But this is an error, as has been demonstrated by the experiment of the late Dr. Darwin, in which, after looking at a coloured object steadfastly for some time, upon shutting the eyes the impression will remain a considerable time, and in an equal degree upon the insertion of the optic nerve, and every part of the retina, without the appearance of any dark spot whatever. This not only proves that that part of the optic nerve which enters the sclerotic coat, and from which the retina proceeds, is susceptible of the impressions of light in the same degree as the retina, but that the vitreous humour, or rather its arachnoid membrane, performs an important office, in addition to that which it performs as a part of a most beautiful and wonderful optical apparatus, that is, it serves to collect and retain the impressions of objects to afford time for the intellect to judge of their distance, as well as of their different properties. The optic nerve passes through an opening in the bottom of the orbit, named foramen lacerum, and crossing the opposite nerve, terminates in that part of the brain, named thalamus nervi optici. This decussation of the optic nerves has been a subject of controversy with anatomists. But the fact is completely proved by an examination of the brain and optic nerves of a horse affected with one

cataract only; and by an examination of the brain and optic nerves of a sheep affected with that kind of hydrocephalus, which depends upon the existence of an hydatid in the right ventricle of the brain; for it is the right ventricle that is generally affected.

In both cases, the nerve which proceeds from the affected thalamus will be found smaller than the other, and it will be found smaller also after it has crossed the other nerve, and to the point where it enters the sclerotic coat of the eye. The thalami nervorum opticorum I consider as the organs of vision, for it is here the impressions of objects are ultimately received, and the parts, absurdly named nates and testes, I consider as the organ of intellect. See Description of the Brain.

Diseases of the Eye.

Though the horse's eye is commonly supposed to be subject to a variety of diseases, they may, without impropriety, be comprehended under two heads. That is, disorders which arise from internal causes, and such as are occasioned by blows, bites, and other accidents. The former are generally, I may say almost always, incurable; that is, they are incapable of a perfect cure, or, in other words, the eye is very rarely

perfectly restored after being so affected, unless a complete cataract, or total blindness, takes place in one eye, as represented in Plate IV, fig. 2. In that case the health and strength of the other, almost always is perfectly established. This is the best termination of ophthalmia, for so this disorder has been named, that can be expected, for the sight of that one eye becomes gradually fully equal in power and correctness of vision to the sight of two perfect eyes. Another favourable termination is in a partial cataract, as represented in Plate IV, fig. 1. This, however, when occurring in one eye, does not establish the health of the other like the perfect or complete cataract, quite the contrary, for when these specks appear in one pupil, and the other eye appears perfectly healthy, it may fairly be presumed, or it is probable, at least, that the healthy eye will sooner or later be affected with ophthalmia. The eye, however, in which these specks appear, generally has its health established, the opthalmic inflammation then usually ceases; and, though these specks are an impediment to vision in a degree proportionate to their extent, and according to their situation, yet they never increase, nor does the opthalmic inflammation ever return in that eye; that is, according to my experience, and it is a subject which has particularly engaged my attention.

Ophthalmia is said to be produced, by veterinary authors, by high feeding, without sufficient exercise, by costiveness, and the stimulating vapours of foul and close stables. These may assist in the production of the disorder, but are by no means the essential cause. It is over exertion that occasions ophthalmia, such as takes place in trotting matches, matches against time on the road, in competitions between coach-masters and post-masters, or their servants, and other cruel and unfair exertions, in which this generous and emulative animal is frequently employed.

In such excessive exertions of the muscular power, the blood is impelled into the delicate vessels of the eye, and produces such derangement in the nervous as well as vascular structure of the organ, as cannot be perfectly repaired. Hence the eye, though apparently cured of the ophthalmic inflammation, remains in a morbidly irritable state, and sooner or later is again affected with inflammation. At length the delicate vessels of the crystalline lens, or its capsule, are ruptured, and partial or total opacity is the consequence; or, in other words, a partial or a complete cataract takes place. When this happens, all that beautiful optical and nervous structure posterior to the cataract, becomes disorganized, and goes to decay; and, on opening

the eye, all the vitreous humour instantly escapes, being no longer included in cells, but liquid like the aqueous humour. The tappetum lucidum loses the brilliancy of its colours, the retina remains, but is shrunk, and in a denser and more opaque state, and the optic nerve is considerably diminished in size. The operation for cataract, therefore, must be useless; and should never be attempted.

Gutta serena, or paralysis of the optic nerve, sometimes occurs in horses; it is always occasioned by excessive exertion, and always productive of incurable blindness. In this case, the crystalline lens retains its transparency; and the disorder, or blindness, may escape a purchaser's notice, unless it be made apparent by placing the horse in a situation where it may be known, by the animal not seeing, or avoiding objects which, if he had sight, he would readily avoid.

Another circumstance deserving a purchaser's notice, is the state or size of the pupil, which is best seen by turning the horse round in the stable, and bringing his head towards the stable door. If the eyes are sound, both pupils will be alike in size, and free from specks. When they are of unequal size, in the same light, the smaller may be considered as having been affected with opthalmia, and still disposed to the

disorder; for it denotes a morbidly irritable state of the nervous structure of the eye.

The same suspicion may be entertained when the pupil is very small, as in Plate I, fig. 2, in the stable, or in a moderate light. When the pupil is rather circular than oblong, of a lighter blue than usual, and rather larger than might be expected, when viewed in a strong light, it denotes an incipient cataract, and with such pupils a horse will generally be given to starting.

On the first attack of ophthalmia, one or both eyes, generally one only, and that the left eye, becomes dull and watery, and soon after is nearly closed. The tears run over the check, and the horse appears unable or unwilling to open the eye, except in the stable, when it is nearly dark. The first thing to be done is to bleed to faintness, however large the quantity of blood it may be necessary to take off in order to produce this effect. The horse must then be kept in a cool, airy, but rather dark stable, and suffered to run loose in it. He must be fed, however, from the rack, or from the manger, and with grass only, if that food can be procured. If there is no grass, he must have only eight pounds of hay in the twenty-four hours, and that divided into four portions; three gallons of water at three different times, and three small bran mashies, that

is, about half a peck of bran in each mash. A muzzle will be necessary to prevent him from eating his litter, or the litter may be removed altogether. When the horse is thus treated, no medicine or eye lotion will be necessary; they cannot do any good. But if an apprehension of bleeding the horse to death, or of starving him, prevents this treatment from being pursued, it may be necessary to give a dose of physic, and, after its operation, small doses of nitre daily. Fomenting the eye with warm water is by far the best topical application while the eye is in a painful, irritable state; but when the inflammation has abated, and the horse is able to keep the eye open, and look at objects without pain, one of the following lotions may be applied, either alone or diluted with water, according to the state of the eye.

In inflammation of the eyes from external injuries, such as bites, blows, &c. copious bleeding is also necessary, and a spare diet; a fomentation of warm water is at first the best application, and when the inflammation has abated, one of the following lotions may be employed.

Sometimes an opacity, or film as it is termed, on the cornea or surface of the eye, is produced by external injuries, and strong stimulating applications are thought necessary for its removal, but such applications always do much harm,

unless the inflammation and irritable state of the organ is first completely subdued. If an opacity remains after this has been effected, and the horse is able to keep the eye open without pain, finely powdered salt may be put into the eye, and repeated for a few days. Stronger preparations are often made use of, such as crude sal ammoniac (muriate of ammonia) sandover, or the frit of glass, and even finely powdered glass, either alone or mixed with honey. Powdered white vitriol, or sugar, are sometimes blown into the eye through a quill. Sometimes tincture of opium is made use of, or a solution of extract of belladonna.

In severe injuries of the eye, nothing but early and copious bleeding will prevent the most serious consequences, and even this will do little unless followed by a spare diet. Here also physic, and afterwards nitre, may be given, but in these severe injuries, as in inflammation from internal causes, bleeding to faintness, and the spare diet I have recommended, will render all medicine unnecessary, and is by far the best mode of treatment.

In ophthalmia, the disorder often remains in a fluctuating state for months, or even for a year or two, but the sight continues imperfect, and is every now and then getting worse. The disorder sometimes appears to go off rather sud-

denly, and after a short time as suddenly returns. Sometimes the disorder suddenly leaves one eye, and affects the other; and sometimes, though the eye to an inexperienced person appears quite well in the evening, the horse will be found nearly blind the next morning. From a supposed periodical recurrence of the disorder, it has been named moon blindness; but the disorder does not quite disappear, there is always a morbid state of the eye that is readily seen by an experienced person.

A horse that has once suffered from ophthalmia should never be purchased as a sound one, however free from disease the eye may appear to a person not conversant with the subject. But in injuries of the eye, or inflammation from blows, bites, &c. the cure is often complete; there is no danger of the disorder recurring, and sometimes a small opacity or film may remain on the cornea or surface of the eye, without any injury to the sight.

In severe injuries, however, there is danger of incurable derangement being produced in the nervous structure of this delicate organ, unless the animal is bled to faintness, and afterwards fed sparingly. In inflammation from excessive exertion, that is, in ophthalmia, nothing but this treatment has any chance of effecting a radical cure, and this, I fear, will too often be found to

fail. It is not by one journey, or match, or race, that the mischief is done; it is by a frequent repetition of immoderate work, or excessive exertion, that the injury is gradually inflicted. It is thus, from time to time, that the blood is impelled into the delicate vessels of the brain and the eye, as well as those of all the other organs of the body, so as to distend, and at length rupture them, and such derangement is thus produced in the nervous structure of the eye, as to establish a morbid irritability, and such an aptitude to inflammation, that it is brought on by the slightest causes, until the delicate transparent parts are rendered opaque, and the nervous structure deranged or disorganized.

Eye Lotions.

- No. 1. Sulphate of zinc 1 dram
 Water 1 pint
 Diluted sulphuric acid 2 drops—Mix.
- No. 2. Superacetate of lead .. 4 scruples
 Water 1
 Distilled vinegar 2 ounces—Mix.
- No. 3. Sulphate of zinc 1 dram
 Superacetate of lead .. 4 scruples
 Water 1 pint—Mix.
- And, after shaking them together, filtre through blotting paper.

Vinous tincture of opium has been employed with advantage in that debility of the nervous structure of the eye sometimes observable in old horses, and indicated by a large pupil of a more circular form, and of a lighter blue colour than usual; also in opacity of the cornea. It is introduced by means of a small camel hair painting brush.

In small, or contracted pupil, extract of belladonna has been recommended. Blistering all the external parts of the eye and forehead has been advised and practised in the 4th dragoons, and was thought to produce a temporary good effect. Setons under the eye have been employed also, and sometimes afford temporary relief; so has blistering the cheek; but no permanent benefit has, I believe, ever been derived from any of these remedies. The vinous tincture of opium I am inclined to think may improve, for a short time, the sight of old horses that are given to starting, but must be applied every time the horse is rode out, and then, perhaps, its efficacy will after a time gradually cease.

Horses that are kept at grass during the hot months of summer, are sometimes so stung about the eyes by flies, as to appear nearly blind. This often causes much alarm and apprehension of danger; but if the horse is taken

into a cool shed or stable, and the eye bathed with a little warm water, or a weak solution of superacetate of lead (sugar of lead), the inflammation will soon go off. This may be kept off at any time by means of train oil.

I annex a rough sketch of the eye, thinking it may render the description I have given more clear. The pupil is drawn, as it appears in an obscure light; and I have endeavoured to draw it in a direction parallel with the horizon, but, being an indifferent draftsman, I have not perfectly succeeded in making the oblong circle of a regular form:—*a* is the pupil; *b* the small black bodies appended to the superior margin of the iris; *c c c c* the iris, as it appears when viewed through the cornea, or glass of the eye; *d* the hair which is on the surface of the cornea; *e* the upper eye lash; *f* a few hairs at some distance from each other, in the under eye lid. See *Frontispiece*, and its explanation.

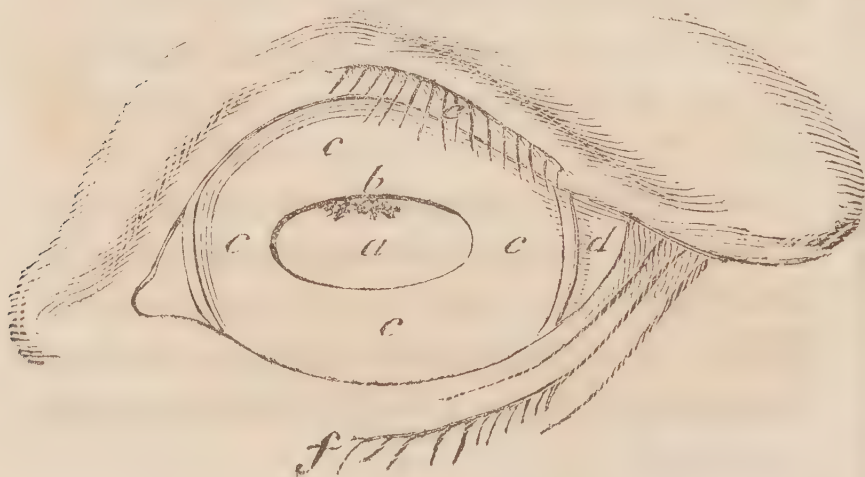
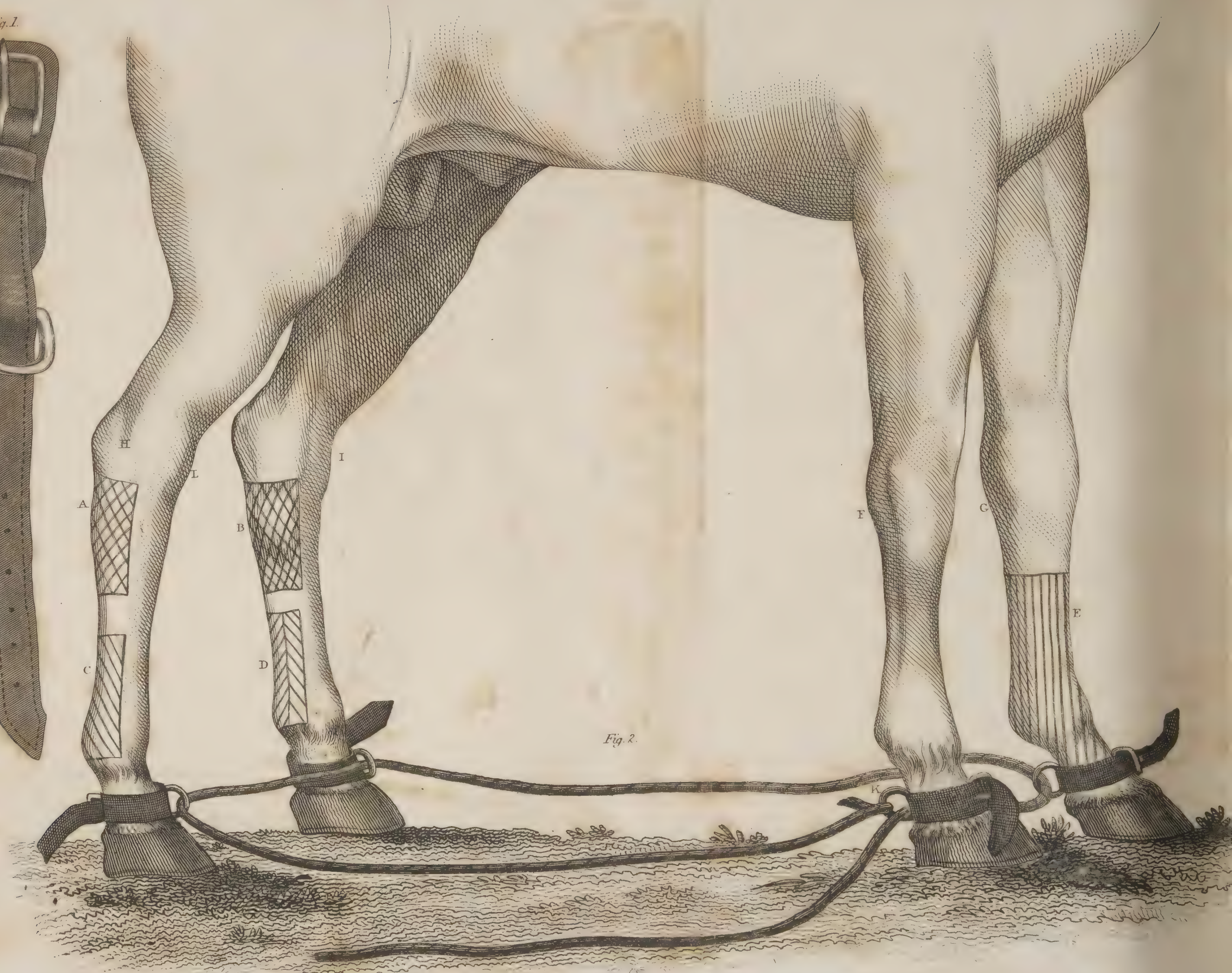




Fig. 1.



Fig. 2.



Wm. Traies Del^t

CHAPTER XXXIII.

ON THROWING DOWN A HORSE IN ORDER TO
SECURE OR HAMPER HIM FOR OPERATIONS.

HORSES are thrown down by means of hobbles, one of which is represented in Plate V, fig. 1 (where *a* is the buckle, *b* the ring); and the whole are represented fixed on a horse's legs, in fig. 2. The hobble is about two feet in length, two inches and five-eighths in width, and about a quarter of an inch thick. It is formed by a strong piece of leather about four feet in length, which, being doubled, has a strong iron buckle included at one end, and firmly sewed in. About four inches and half further back, a large iron ring is to be sewed in, in the same manner, for the purpose allowing a strong rope to pass through it easily. The ring, or rather the part so named, may be made straight where it is sewed into the leather, and the rest rounded. The remaining part of the leather is to be strongly sewed together, which will make the thickness of it what we have before described. Several holes are to be punched at this end of the hobble, to admit the tongue of the buckle when it is put round the horse's leg.

On the under side of the hobble, a piece of thin and wider leather is to be fixed, extending from the part where the ring is attached to about half an inch beyond the extremity of the buckle; this is intended to prevent the latter from galling the horse's leg. The rope should be strong, not twisted, tight, but made flexible, like a bell rope, and about six yards in length. One end of the rope is to be firmly and permanently attached to the ring of one of the hobbles, and this hobble must be placed on the fore leg, opposite to the side on which the horse is to be thrown. If the hobble to which the rope is attached is placed on the left fore leg, the other end of the rope is to be passed first through the ring of that on the left hind leg, then through that on the right hind leg, next through that on the right fore leg, and last through the ring, where the rope is attached, that is, the left fore leg hobble.

By this contrivance, it will be readily seen that the legs of the horse may be drawn together, so that if pushed or forced towards the right side, he must of necessity fall. Three men are generally required to pull the rope, in order to draw the legs together; and to render this more easy, the hind legs should be placed under him as much as possible, before any attempt is made to pull the rope. The horse

should have blinds, or have his eyes covered with a piece of rug, before the hobbles are put on: it may be necessary, also, to twitch him, and hold up the fore leg while the hind leg hobble is putting on. But the twitch must be removed before he is thrown, and not used unless absolutely necessary. The men who are to pull the rope should stand within two yards of the horse, as they then pull with double the force they would at a distance of four yards, their power then having a tendency to draw the legs off the ground and upwards, which causes him to fall more quickly. One man should stand at the rump, on the left side, to push him when the legs are drawn up together; and one man should hold him steadily by the head, standing in front of him, and as soon as the horse is down, that man should throw himself on the neck, and incline the nose upward by lifting the halter; thus he can keep the head and neck down without difficulty.

M. Girard, in his *Traité du Pied*, has proposed an improvement in throwing horses, which is very simple, and should always be employed; but it requires an additional assistant, or two would be still better. If the horse is to be thrown on the right side, a long piece of web, or a rope, is to be fastened round the right fore arm, close up to the elbow. The other end

is then to be passed over the withers, and held at a little distance by one or two men. The force which is applied in this way will cause the horse to fall more readily, and with more certainty, and exactly in the situation where he is required to be thrown. This contrivance, therefore, is extremely useful in confined places, where there is just room enough to throw a horse, and no more. The horse being thrown down, and the legs closely drawn together, the end of the hobble rope is to be passed under the hobble rings, between the fore and hind, and secured with a hitch, as it is termed, so that he cannot separate the legs again, until the hobbles are unbuckled, and then they all may be taken away at once, and the horse suffered to get up.

In letting up the horse again, the hobbles must be unbuckled cautiously, beginning with the under fore and hind one. These should be unbuckled gently, and not jerked, as that would cause the horse to struggle, and render it difficult to take them off, or the leg might get loose, and he may thus hurt one of the assistants, who happens to be standing incautiously, within the stroke of his fore or hind leg. I have seen hobbles in which the tongues were moveable, so that by drawing them out with a pair of pincers, the hobbles were all taken off at once.

In performing operations upon the horse, it

is not only necessary to throw him down, as I have described, but in firing the outside of the fore leg, for example, in the pastern, the hobble must be taken off, and the leg secured, by means of a web, passed round the leg, above the knee, and secured to the upper hind leg, immediately above the hock, or it may be secured to the under fore leg; perhaps both these contrivances would be found useful in strong horses that struggle much. In firing the inside of the fore leg, that is, the under fore leg, nothing more is necessary than to take it out of the hobble, and draw it forwards by means of a web passed round the hoof, or the pastern.

Horses, however, have sufficient power to extend even the under fore leg considerably, unless a man lies on the shoulder, which should always be avoided. It is better to restrain the leg, by passing a web round it, above the knee, and fastening the other end to the hind leg above the hock. If then the other three legs are drawn backward, by means of the hobble rope, the under fore leg will be sufficiently exposed for any operation that may be required. In firing the upper hind leg, in the pastern, it is necessary to take off the hobble; but the leg must first be secured by means of a web, fastened above the hock, and the other end brought forward, and, under a collar of web, passed round

the neck, close to the shoulder. The leg may thus be effectually restrained; but, as an additional restraint, it may be tied also to the under hind leg.

In securing a horse for castration, he should be placed on his left side, the right hind leg should then have one web placed above the hock, and another above the pastern, both of these webs should then be passed under the collar, and the leg drawn up as far as possible, or until the hind foot is brought considerably beyond the fore leg. Here it must be firmly secured, for unless this is done, the operator will be in great danger. When the upper hind leg is thus secured, the testicles will be completely exposed. I have found it useful also, in this operation, to make a man lie down on the horse's body, and grasp the hock and hind leg with his hands; this seems to confine the leg more completely.

Another method of hampering a horse is sometimes employed, but is far from being so safe or effectual as throwing him down. This is termed the side line. The rope hobble is buckled on one of the hind legs, the rope is then brought forward between the fore legs, and over the opposite shoulder; the end is then passed under the rope at the chest, and after drawing up the leg sufficiently, it is secured in

this situation with a hitch, which may be quickly loosened in case of the horse's struggling, so as to be in danger of falling. This contrivance is rendered much more secure, if the horse's head be firmly secured to a strong ring in the manger, and his hind parts supported by a breeching, while kicking and lying down may be prevented by a back and a belly strap.

There is a permanent contrivance for securing a horse in this way, named a break or a trevis. I once knew a horse die by struggling in a break, therefore I consider them dangerous: they are chiefly used in nicking and docking horses, and in shoeing vicious horses. A plate, and description of a break, may be found in Bourgelat's *Essai sur les Appareils et sur les Bandages propres aux Quadrupèdes*.

Another method is commonly employed in throwing down cattle. A long rope is doubled and tied in a bow at the doubled end, of sufficient size to go over the animal's head, and rest at the bottom of his neck like a collar. The two ends, of equal length, are then to be brought down between the fore and hind legs, and one of the ends round each hind leg. The ends of the rope are now drawn forwards on both sides, by which the hind legs are so drawn up under the belly, that he is easily pushed down, and must then be secured.

Explanation of Plate V.

Letter A represents a curb, and the manner of firing for that disorder. B represents a small bone spavin, and the manner of firing for that disorder. C represents another manner of firing, more commonly employed; D another. E the straight line firing, sometimes carried all around the leg, and down over the pastern to the coronet. The pit of the heel must always be avoided both in firing and blistering, as it is apt to produce troublesome cracks or ulcers. F shows the seat of the disease, named mallenders. G the seat of the speedy cut. H is the seat of the disorder, named Thorough Pin. I, the seat of a bog spavin. K shows the hobble to which the rope is permanently attached. L the seat of the disease, named Sallenders.

APPENDIX.

SETON THROUGH THE FROG.

A NEW operation has been practised at the Veterinary College, for chronic lameness of the feet, which, it is said, has been so far successful as to have afforded considerable relief. It consists in passing a seton through the cleft of the frog, and bringing it out at the pit or hollow part of the heel.

In slight degrees of chronic lameness, we sometimes find that the horse goes much better upon a thrush taking place in the frog; and the lameness is sometimes completely removed by such a discharge taking place. We also often find in thrushes of some standing, or habitual thrushes, that, upon applying strong astringent or detergent preparations, and thereby stopping the thrush, that inflammation of the foot and lameness are the consequences.

In all cases of chronic lameness of the feet, attended with a morbid degree of heat, and a

hard sound frog, it is advisable to keep the foot constantly soaked in a bran poultice: this will always afford some relief; and I have thought that, by paring the frog in such cases, and keeping it in contact with fresh cow dung for some time, an artificial thrush may be established, and with considerable advantage. It is certainly worth a fair trial. Having thus established a thrush, a shoe should be applied with rather thick and wide heels. I have known chronic lameness much diminished, and even removed, by this treatment. A seton needle for this operation may be had at Mr. Long's, High Holborn, London; or at Mr. Clark's, York-buildings, Bath; veterinary instrument makers and cutlers.

Since this volume went to press, the Nerve Operation appears to have fallen considerably in the opinion of the public, from many cases having occurred of loss of the hoofs, and mortification of the feet, at different periods after the operation. There are cases, however, in which it is decidedly useful, and sufficiently durable in its effect, to render its adoption advisable.

Much has been said of the cruelty of the operation, but always by persons who know but little about it, and who have no practical knowledge of its immediate or remote effects. The

pain of dividing the nerve is but momentary; the relief it affords is considerable and immediate, and sometimes, especially when the horse is a proper subject for the operation, it lasts for many years.

It has been ascertained that the substance which supplies the place of the portion of nerve which has been removed, is not capable of conducting sensation, though it has somewhat the appearance of nerve.

Mr. Leigh, veterinary surgeon, of Bristol, had a horse under his care affected with canker. This horse became so violent while dressing, from the pain he suffered, that it was found at last impossible to do any thing with him. The Nerve Operation was therefore performed, in order to render the foot insensible. After this the horse was dressed without difficulty, and the canker was completely cured. This happened about four years ago, and the horse is at this time quite sound, and very useful as a carriage horse.

The same person informs me that he has met with several cases of chronic lameness lately, which appear to confirm what I have before observed, when speaking of the Nerve Operation and Founder, that is, that in a large proportion of such cases, there is a disease of the coffin-

joint, especially at the articulation of the navicula with coffin bone, and sometimes with the pastern. See chapter on Thrush, and sections on Nerve Operation, and Founder.

ERRATUM.

Page 154, line 13, *for* general, *read* generally.

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